

HITACHI


PA**No. 0092****27MM20B
27MM20BA****NTSC*****PA-1/PA-2 Chassis*****R/C: CLU-433PC
CLU-433MC**

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CAUTION: Before servicing this chassis, it is important that the service technician read the "Product Safety Notices" in this service manual.

SAFETY NOTICE

USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by a  on the parts list in this Service Data and its supplements and bulletins. Before servicing the chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Manual.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety-related notes located on or inside the cabinet and on the chassis or picture tube.

WARNING: Since the chassis of this receiver is connected to one side of the AC power supply during operation, whenever the receiver is plugged in, service should not be attempted by anyone unfamiliar with the precautions necessary when working on this type of receiver.

The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away from the picture tube while handling.
2. When service is required, an isolation transformer should be inserted between power line and the receiver before any service is performed on a "HOT" chassis receiver.
3. When replacing a chassis in the receiver, all the protective devices must be put back in place, such as barriers, nonmetallic knobs, adjustment and compartment cover-shields, isolation resistors, capacitors, etc.
4. When service is required, observe the original lead dress in the high voltage circuitry area.
5. Always use the manufacturer's replacement components. Critical components as indicated on the circuit diagram should not be replaced by another manufacturer's. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the receiver by the manufacturer has become defective, or inadvertently defeated during servicing.

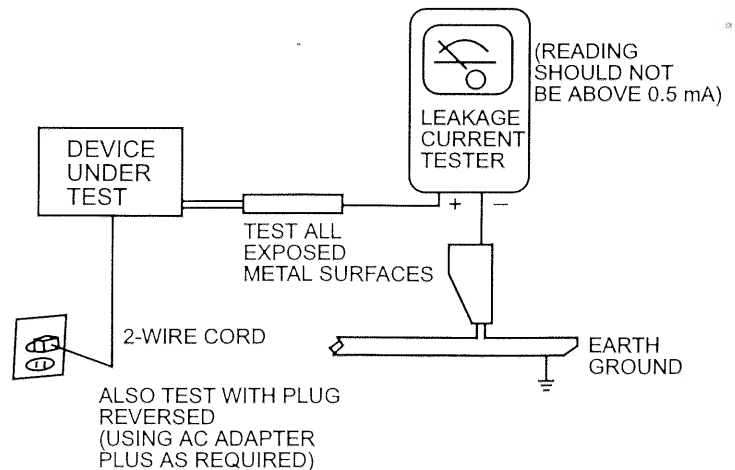
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check

With the AC plug removed from the 120V AC 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch ON using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis should have a minimum resistor reading of 0.24Mohm and a maximum resistor reading of 12Mohm. Any resistance value below or above this range indicates an abnormality which requires corrective action. An exposed metal part having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a 120V AC 60Hz outlet (do not use an isolated transformer for this check). Turn the AC power ON. Using a Leakage Current Tester (Simpson's Model 229 or equivalent), measure for current from all exposed metal parts of the cabinet (antennas, screwheads, overlays, control shafts, etc.) particularly any exposed metal part having a return path to the chassis or to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5 milliamps.



AC LEAKAGE TEST

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE RECEIVER TO THE CUSTOMER.

High Voltage

This receiver is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this service manual regarding this hold down circuit when servicing, so that this hold down circuit is operated correctly.

Serviceman Warning

With minimum BRIGHTNESS and CONTRAST, the operating high voltage in this receiver is lower than 37.0kV. In case any component having influence on the high voltage is replaced, confirm that high voltage with minimum BRIGHTNESS and CONTRAST is lower than 37.0kV. To measure high voltage use a High Impedance High Voltage meter. Connect (-) to chassis earth and (+) to the CRT Anode button. (See the following connection diagram.)

Note: Turn power switch OFF without fail before the connection to the Anode button is made.

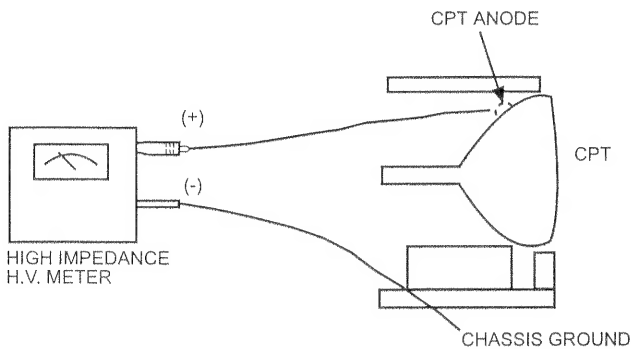
PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receivers have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified with an \triangle mark in the schematics and parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI-recommended replacement component, shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.

Production safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies of HITACHI Service Manuals may be obtained at a nominal charge from HITACHI Sales Corporation.



X-Radiation

TUBE: The primary source of X-Radiation in this receiver is the picture tube. The tube utilized in this chassis is specially constructed to limit X-Radiation emissions. For continued X-Radiation protection, the replacement tube must be the same type as the original HITACHI-approved type.

When troubleshooting and making test measurements in a receiver with an excessive high voltage problem, avoid being unnecessarily close to the picture tube and the high voltage component.

Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.

This Service Manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void warranty.

Consumers should not risk trying to do the necessary repairs and should refer to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health and Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with solder. Also, when soldering do not inhale any smoke or fumes produced.

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics identified by \triangle on the parts list in this service manual and its supplements and bulletins. Before servicing this product, it is important that the service technician read and follow the "Safety Precautions" and the "Product Safety Notices" in this Service Manual.

For continued X-Radiation protection, replace picture tube with original type or HITACHI equivalent type.

POWER SOURCE

This television receiver is designed to operate on 120 Volts/60Hz, AC house current. Insert the power cord into a 120 Volts/60Hz outlet.

NEVER CONNECT THE TV TO OTHER THAN THE SPECIFIED VOLTAGE OR TO DIRECT CURRENT.

AGENCY REGULATORY INFORMATION
--

Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hitachi Home Electronics (America), Inc. may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods to maintain compliance with FCC Rules and Regulations.

Any cables that are supplied with the system must be replaced with identical cables in order to assure compliance with FCC rules. Order Hitachi spares as replacement cables.

Declaration of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any cables that are supplied with the system must be replaced with identical cables in order to assure compliance with FCC rules. Order Hitachi spares as replacement cables.

For questions regarding this declaration, contact:

Hitachi Home Electronics (America), Inc.
1855 Dornoch Court
San Diego, CA 92173
(619) 661-0227

TECHNICAL SPECIFICATIONS

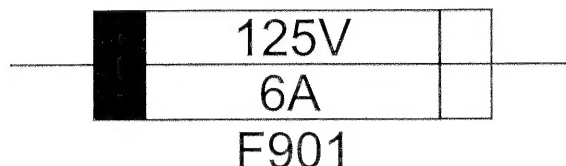
PICTURE TUBE

27MM20B/PA-1.....A68KSA30X
27MM20BA/PA-1.....A68KSA30X

CAUTION

The following symbol near the fuse indicates fast operating fuse (to be replaced). Fuse ratings appear within the symbol.

Example:



The rating of fuse F901 is 6.0A-125V.
Replace with the same type fuse for continued protection against fire.

Inputs:

- Power InputAC 120V, 60Hz
- Power Consumption (operating)188W
- Power Consumption (maximum)188W
- Antenna input impedance75 Ohm
- Channel coverage181 ch.
- VHF-Band2 ~ 13
- UHF-Band14 ~ 69
- CATV Mid BandA-5 ~ A-1
- Super BandJ-W
- Hyper BandW+1 - W+28
- Ultra BandW+29 - W+84
- Video input1.0Vp-p, 75 Ohm
- S-Video input
Luminance (Y)1.0Vp-p, 75 Ohm
- Chrominance (C)0.286Vp-p, 75 Ohm
- Audio input level (average)400mVrms, 47K Ohm

Outputs:

- Audio Output (variable)400mVrms, 1K Ohm

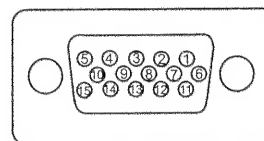
Dimensions:

- Height (in.) $23\frac{1}{32}$
- Width (in.) $27\frac{9}{32}$
- Depth (in.) $20\frac{13}{64}$
- Weight (lbs.) 88

VGA SPECIFICATIONS

TYPE	PS2-1	PS2-2	PS2-3
MODE	640X350	640X400	640X480
HORIZONTAL FREQUENCY	31.469Khz	31.469Khz	31.469Khz
VERTICAL FREQUENCY	70.08Hz	70.08Hz	59.94Hz
SYNC TYPE	H/V separate	H/V separate	H/V separate
SYNC POLARITY	H	TTL: positive	TTL: negative
	V	TTL: negative	TTL: positive

D-Sub Mini 15-Pin Connector Pin Assignments



PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	Red Video	9	No Connection
2	Green Video	10	Ground
3	Blue Video	11	No Connection
4	Ground	12	No Connection
5	Ground	13	H-Sync (or H/V sync)
6	Red Ground	14	V-Sync
7	Green Ground	15	Ground
8	Blue Ground		

NOTE: Due to improvements, specifications in this operating guide are subject to change without notice.

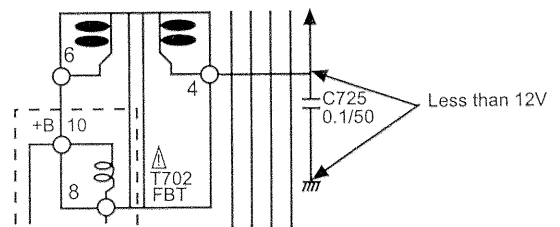
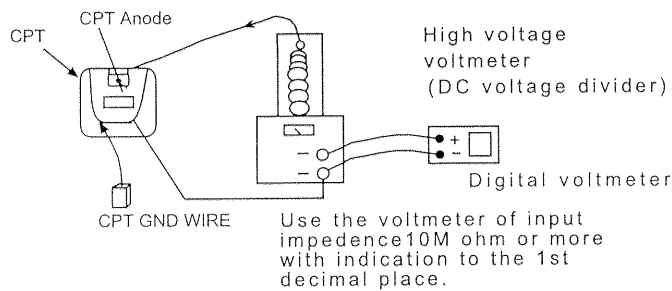
TECHNICAL CAUTIONS

HV Protection circuit operation checking.

High voltage limiter circuit operation check and over voltage protection circuit operation check.

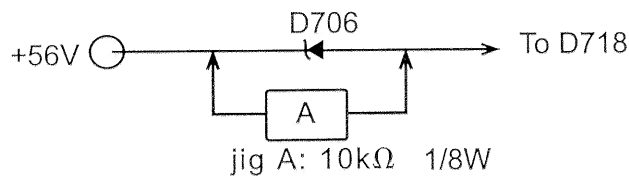
Adjustment Preparation

- (1) Connect a high voltage voltmeter between CPT anode terminal (Anode cap side) and the ground as below.
- (2) Set AC input voltage to $120 \pm 3V$.
- (3) Receive Hitachi circle pattern and set "Bright" and "CONTRAST" to max. Adjust Screen VR so that Beam Current is $1.15 \pm 0.1mA$. (The voltage of ABL terminal-C725 both ends should be 12V or less)



Adjustment Procedure

- (1) Check that the normal High Voltage is $27.0 \pm 1.5KV$ and +B Voltage is $130 \pm 1.5V$.
- (2) Connect jig A to the both end of R706 and check that power is turned off.



- (3) Disconnect the AC plug and remove jig A.

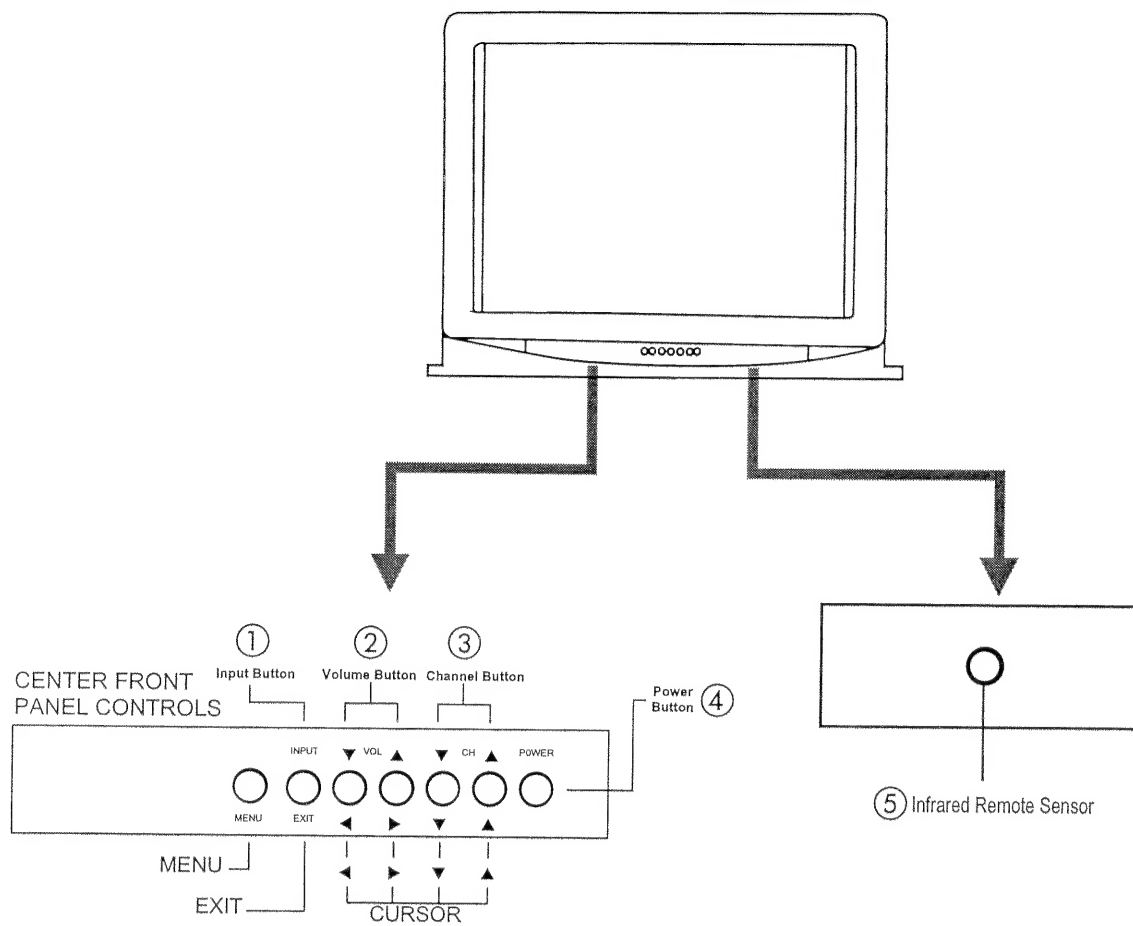
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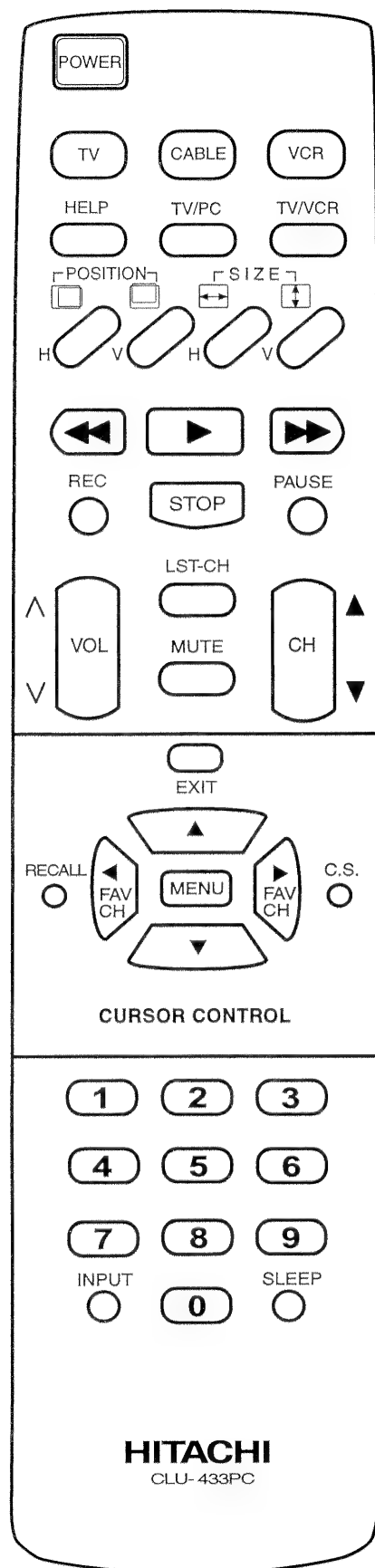
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• **Front Panel and Remote Control Operation.**

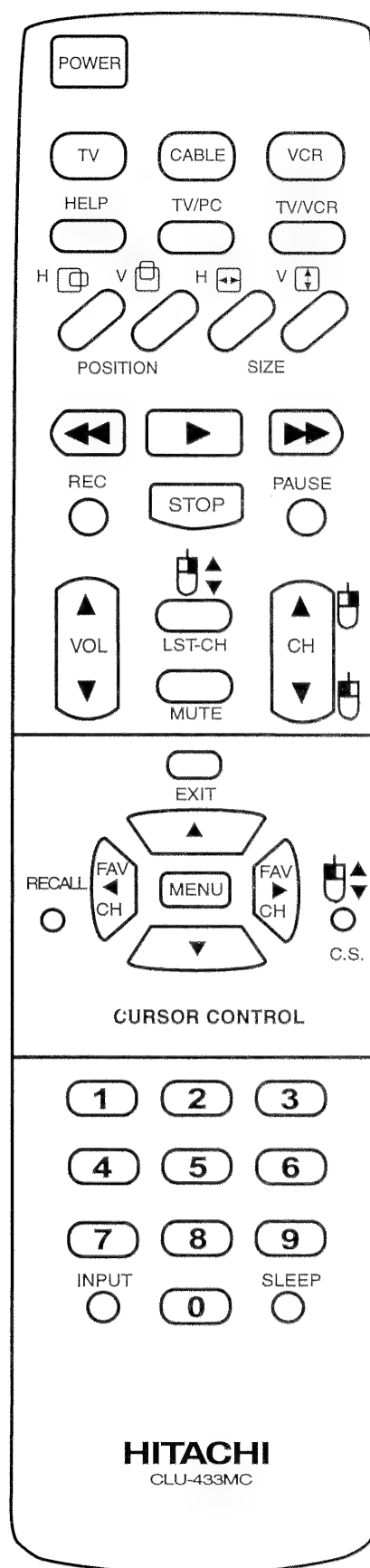
1. Front Panel Controls (refer to remote control operation for basic operation)



2. Remote Control Operation



27MM20B



27MM20BA

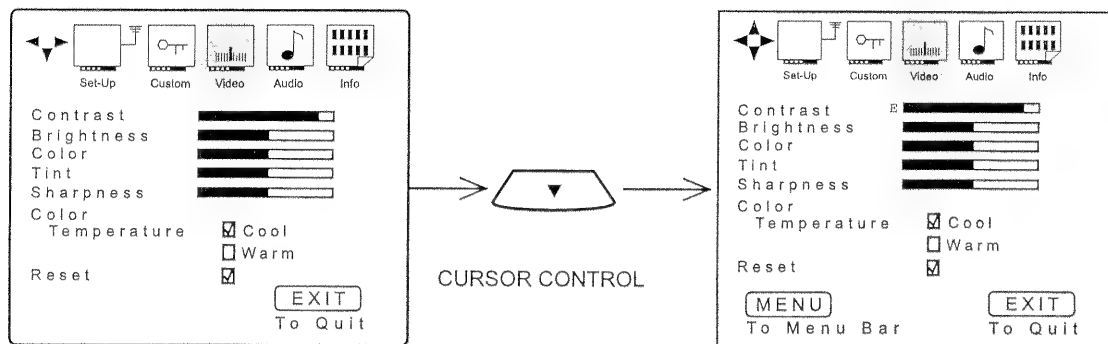







2.1



VIDEO

Select VIDEO to adjust picture settings and improve picture quality.



Use the CURSOR  or  to highlight the function to be adjusted.
Press CURSOR  or  to adjust the function.
Press EXIT to quit menu or CURSOR  to return to previous menu.

CONTRAST

Use this function to change the contrast between black and white levels in the picture.

BRIGHTNESS

Use this function to adjust overall picture brightness.

COLOR

Use this function to adjust the level of color in the picture.

TINT

Use this function to adjust flesh tones so they appear natural.


SHARPNESS

Use this function to adjust the amount of fine detail in the picture.

COLOR TEMP.

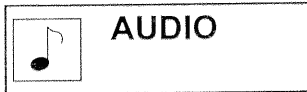
Use this function to adjust the white balance (hue) of the picture to your own color preference.
When shipped from the factory, this is set to COOL. If you prefer a reddish screen, set to WARM.

RESET

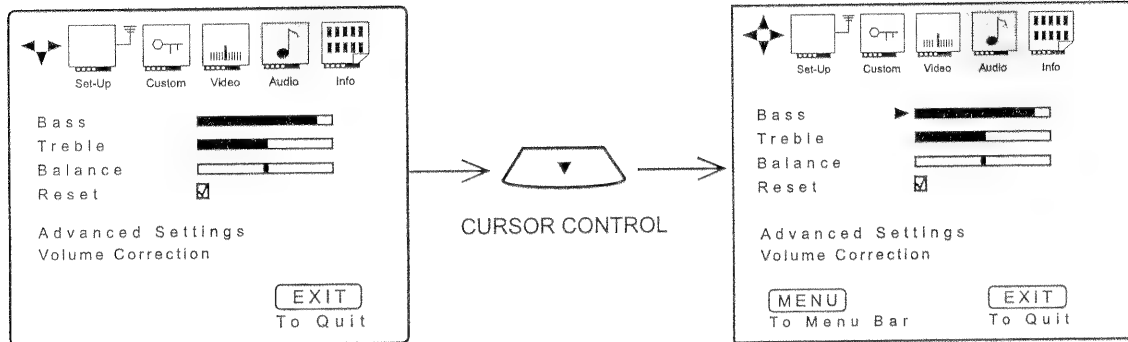
When RESET is selected, the "ARE YOU SURE?" display will appear on the screen to confirm your choice. Press CURSOR  to return VIDEO adjustments to factory preset conditions.



2.2



Select AUDIO to adjust the TV to your preference and to improve the sound quality.



Use the CURSOR or to highlight the function to be adjusted.
 Press CURSOR or to adjust the function.
 Press EXIT to quit menu or CURSOR to return to previous menu.

BASS

This function controls the low frequency audio to all speakers.

TREBLE

This function controls the high frequency audio to all speakers.

BALANCE

This function will control the left to right balance of the TV internal speakers and the AUDIO TO HI FI output.

RESET

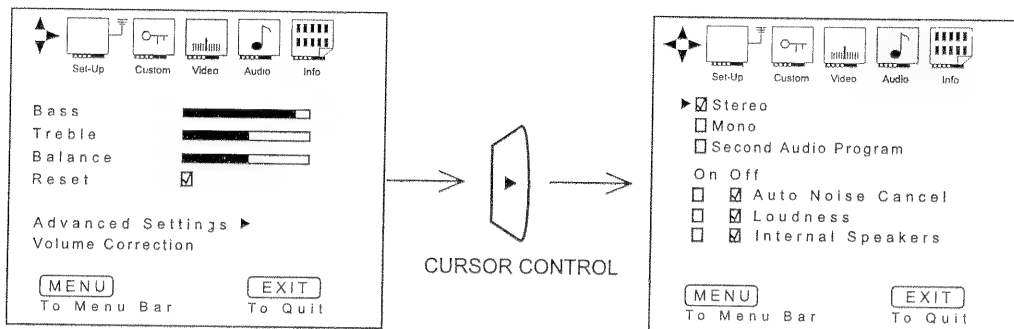
When RESET is selected, the "ARE YOU SURE?" display will appear on the screen to confirm your choice. Press CURSOR to return AUDIO adjustments to factory preset conditions.



2.3

ADVANCED SETTINGS

Use ADVANCED SETTINGS to improve the sound performance of your TV depending on listening conditions.

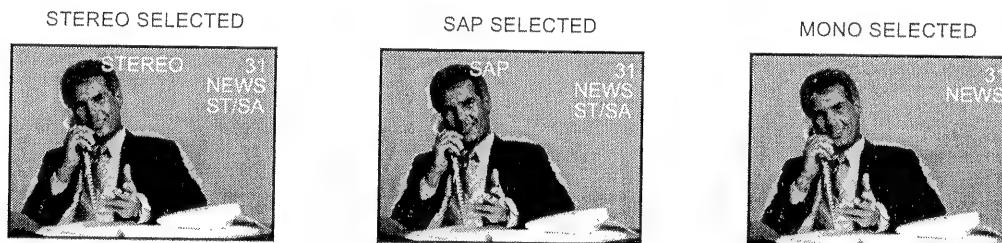


Press CURSOR or to highlight a function.
Press CURSOR to change the function setting.
Press EXIT to quit menu or CURSOR to return to previous menu.

MTS MODE

Multi-Channel Television Sound (MTS) will allow you to select STEREO (Stereo Broadcast), SAP (Second Audio Program) which may be a secondary language, weather report, etc. or MONO (Monaural Sound) used when receiving a weak stereo broadcast.

The sources received will be displayed below the channel number. The MTS mode you selected will be displayed to the left of the channel number. See example below for each selection when both stereo and second audio are received (monaural is always received).



AUTO NOISE CANCEL

This function eliminates the noise in between stations. If a channel is tuned and is noisy, this function will automatically eliminate the audio for that channel.

LOUDNESS

This function will improve the quality of both low and high frequency sounds when listening at low volume levels.

INTERNAL SPEAKERS

This function is useful when first setting up the external speakers, or if you prefer to use only speakers from a separate stereo system.

2.4 PC MODE CONTROLS

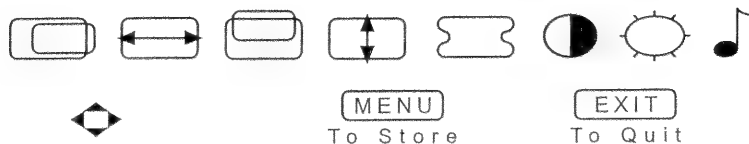


1) MENU

Press MENU to display PC mode On-Screen Display.

PC MAIN MENU

There are eight features that allow you to set up your multimedia vision (while in PC Mode) to your preference. Features from left to right are H Position, H Size, V Position, V Size, Pinchusion, Contrast, Brightness and Audio.



After completing adjustment, press MENU to store.

2) EXIT

Press EXIT button to exit the on-screen display.

3) CURSORS

Use Left/Right cursors to highlight a feature and Up/Down cursors to select the highlighted item, then use left/right cursors to adjust. These buttons are also used for mouse cursor remote control operation.

4) TV/PC Button

Press this button to toggle back and forth between TV and PC mode.

5) H Position

Press to display PC horizontal position adjustment bar. Press cursor left/right to adjust PC horizontal position.

6) V Position

Press to display PC vertical position adjustment bar. Press cursor left/right to adjust PC vertical position.

7) H Size

Press to display PC horizontal size adjustment bar. Press cursor left/right to adjust PC horizontal size.

8) V Size

Press to display PC vertical size adjustment bar. Press cursor left/right to adjust PC vertical size.

9) LAST CHANNEL (LST-CH) Button

Press to perform mouse right button drag, toggle.

10) C.S. Button

Press to perform left button drag, toggle.

11) Channel Up/Down Button

Use the channel up (▲) button to perform a right click. Use the channel down (▼) button to perform a left click.

Note: 1. This monitor can display only VGA formats:

PS2-1 640 X 350 (horizontal frequency: 31.469kHz, vertical frequency: 70.08Hz)

PS2-2 640 X 400 (horizontal frequency: 31.469kHz, vertical frequency: 70.08Hz)

PS2-3 640 X 480 (horizontal frequency: 31.469kHz, vertical frequency: 59.94Hz)

THIS MONITOR WILL NOT DISPLAY VGA SETTINGS ON A SVGA OR HIGHER RESOLUTION NOTEBOOK PC, IF YOU USE THE BUILT-IN LCD DISPLAY AT THE SAME TIME WITH THE MONITOR.

If PC display setting is wrong the monitor will display: "Please set PC for 640x480 display."

2. This monitor uses PS/2 format for the mouse interface. On some PC's, the mouse control may not work in the following situations:

- Disconnecting and reconnecting mouse cable while TV and PC power is turned on.
- Turning on the PC power before turning on the TV power.
- Operating systems other than Windows 3.1x and Windows 95.

Consult your PC operation manual for the keyboard keys to re-start or shutdown your computer.

3. PC MODE CONNECTION AND OPERATION

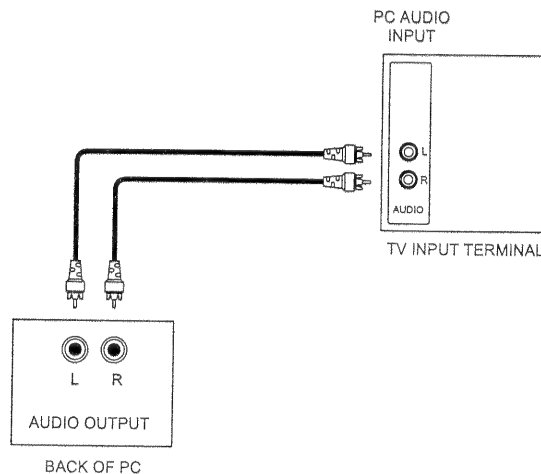
IMPORTANT: TURN POWER OFF ON THE TV/PC MONITOR AND THE PC BEFORE CONNECTING OR DISCONNECTING ANY CABLES.


3.1 PC MOUSE CONTROL OPERATION

1. Connect the 6 pin-din cable (provided) to the PC and monitor.
2. Turn the TV/PC monitor power on.
3. Press the input button three times on the front panel or on the remote control to select PC mode.
4. Turn the PC power on.
5. After the PC has completed booting, use the cursor buttons on the TV front panel or on the remote control to move the mouse cursor up/down/left/ or right to make selections. Use the channel down, channel up, C.S., and LST-CH buttons to perform other mouse functions.

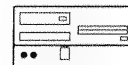
3.2 PC AUDIO INPUT OPERATION

1. Connect the audio output of the PC to the PC Audio Input on the TV/PC monitor as shown below.



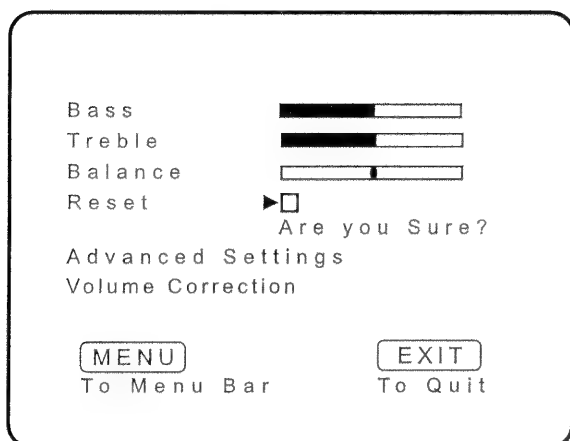
2. Turn the TV/PC monitor power on.
3. Press the input button three times on the front panel or on the remote control to select PC mode.
4. Turn the PC power on.
5. Press volume up (▲) or down (▼) to increase or decrease the sound level.
6. Press the menu button on the TV/PC monitor front panel or on the remote control to display the PC on-screen display.
7. Press the right (▶) or left (◀) cursor buttons to select the audio menu .
8. Press the up (▲) or down (▼) cursor buttons to access the audio adjustment functions.

4. PC ON-SCREEN DISPLAYS



4.1

PC AUDIO OPERATION



Use the CURSOR ▲ or ▼ to highlight the function to be adjusted.

Press CURSOR ◀ or ▶ to adjust the function.

Press EXIT to quit menu or CURSOR ◀ to return to previous menu.

BASS

This function controls the low frequency audio to all speakers.

TREBLE

This function controls the high frequency audio to all speakers.

BALANCE

This function will control the left to right balance of the TV internal speakers and the AUDIO TO HI FI output.

RESET

When RESET is selected, the "ARE YOU SURE?" display will appear on the screen to confirm your choice. Press CURSOR ▶ to return AUDIO adjustments to factory preset conditions.

ADVANCED SETTINGS

See page 40 for details.

VOLUME CORRECTION

See page 41 for details.

NOTE: These audio settings are common to both TV and PC modes.
Changing settings in either mode affects the other



PC ON-SCREEN DISPLAY

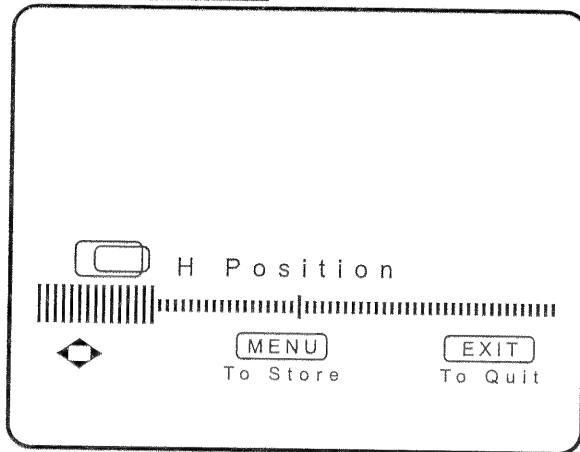
4.2 PICTURE ADJUSTMENTS

The following adjustments are independent of the TV mode:

- Press MENU in PC mode for on-screen display.
- Press CURSORS right (▶) or (◀) left to highlight the item to be adjusted.
- Press CURSORS up (▲) or down (▼) to select the highlighted item.
- Use CURSORS right (▶) or (◀) left to adjust.

H POSITION

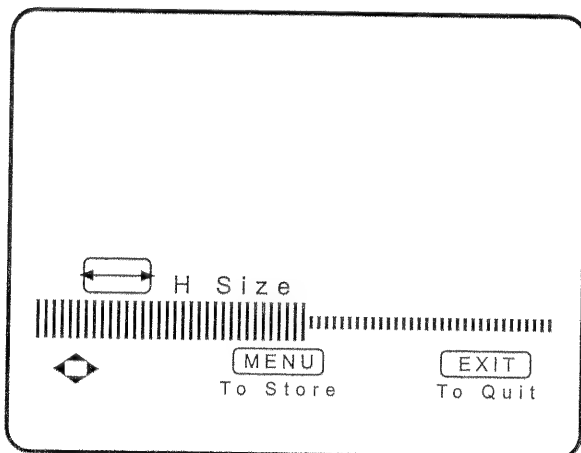
This feature allows you to adjust the horizontal position of the display.



Use Left/Right cursors to adjust the horizontal position.
Press the MENU button to store and EXIT to quit.

H SIZE

This feature allows you to adjust the horizontal size in PC mode.



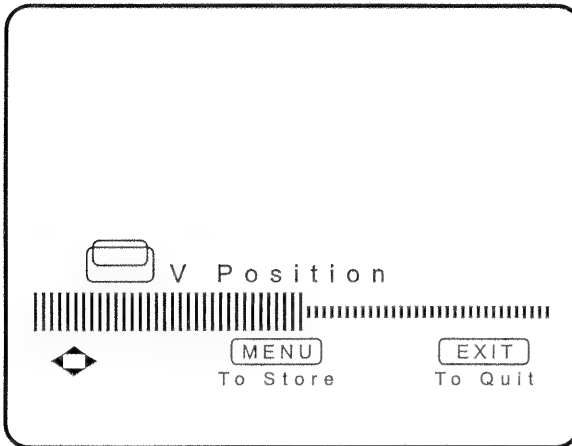
Use Left/Right cursors to adjust the horizontal size.
Press MENU button to store and EXIT to quit.

PC ON-SCREEN DISPLAYS



V POSITION

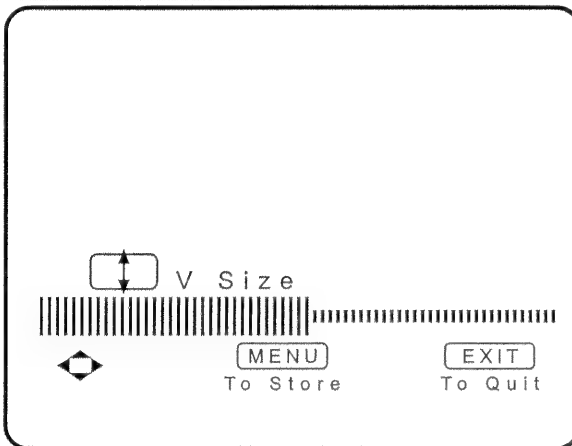
This feature allows you to adjust the vertical position in PC Mode.



Use Left/Right cursors to adjust the vertical position. Press MENU button to store and EXIT to quit.

V SIZE

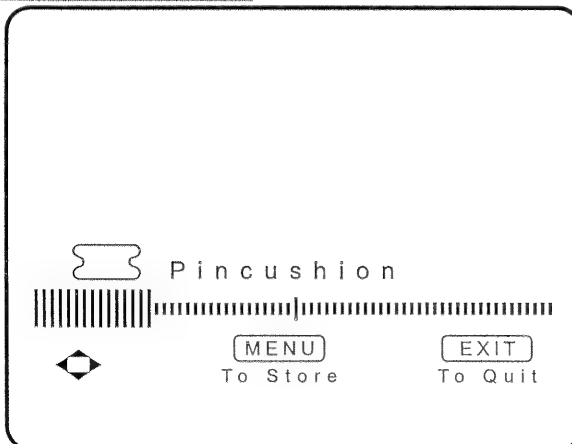
This feature allows you to adjust the vertical size in PC mode.



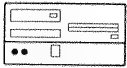
Use Left/Right cursors to adjust the vertical size. Press MENU button to store and EXIT to quit.

PINCUSHION

This feature allows you to adjust the left and right sides (pincushion) in PC Mode.



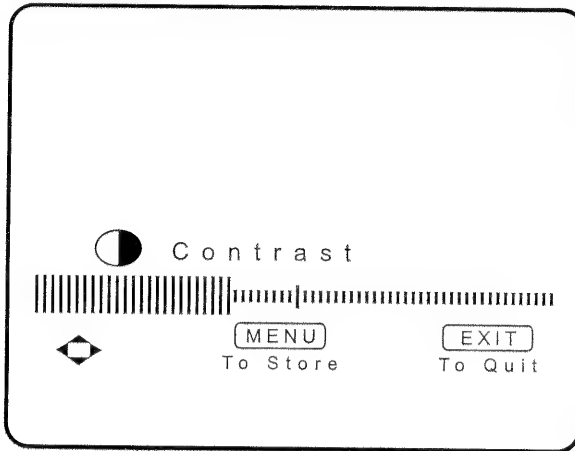
Use Left/Right cursors to adjust pincushion. Press the MENU button to store and EXIT to quit.



PC ON-SCREEN DISPLAYS

CONTRAST

This feature allows you to adjust the contrast in PC mode.

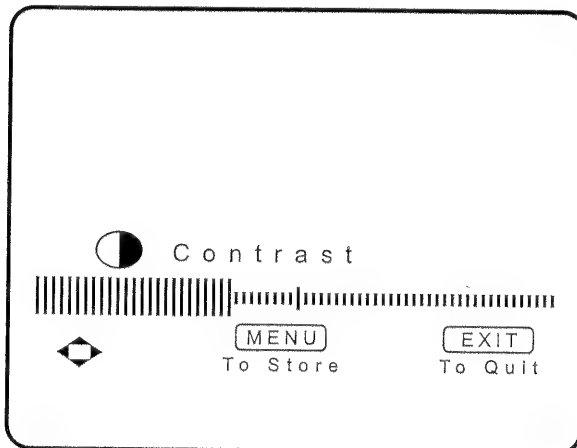


Use Left/Right cursors to adjust contrast.
Press MENU button to store and EXIT to quit.

NOTE: See TV contrast feature for additional information regarding contrast.

BRIGHTNESS

This feature allows you to adjust brightness in PC Mode.



Use Left/Right cursors to adjust brightness.
Press MENU button to store and EXIT to quit.

Chassis Adjustments

1. Adjustment Codes.

Table-1
TV Adjustment Codes

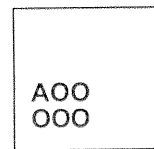
TV/PC MODE	Adj Code	Function	Range
TV Mode	A01	Stereo VCO	
	A02	SAP VCO	
	A03	Filter	
	A04	Input Level	
	A05	Separation (L)	
	A06	Separation (H)	
	P01	PIF VCO	
	P02	RF AGC	
	P03	R Cut off	
	P04	G Cut off	
	P05	B Cut off	
	P06	G Gain	
	P07	B Gain	
	P08	Sub. Bright	
	P09	Sub. Color	
	P10	Sub. Tint	
	P11	Sub. Sharpness	
	D01	V size	
	D02	V Liniality	
	D03	V S-correction	
	D04	V correction	
	D05	H-size	
	D06	Pincushion correction	
	D07	Corner Distortion	
	D08	Trapezoid distortion	
	D09	H correction	
	D10	Vf -correction	
	D12	H-center	
	D16	V-center	

Table-2
PC Adjustment Codes

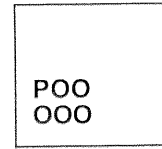
TV/PC MODE	Adj Code	Function	Range
PC Mode	P12	R Gain	
	P13	G Gain	
	P14	B Gain	
	P15	Sub Bright	
	D02	V-Liniality	
	D03	V-S-correction	
	D04	V-correction	
	D06	Pincushion correction	
	D07	Corner correction	
	D08	Trapezoid distortion	
	D09	H-correction	
	D10	Vf -correction	
	D12	V-center	
	D13	H-center	
	D14	V-size	
	D15	H-size	
	D17	Mouse speed	

1.1. How to access the adjustment codes.

- Turn the TV power off.
- Using the front panel controls, press and hold the "INPUT" button while pressing the "Power" button to turn the TV on.
Keep the "INPUT" button pressed until the put I²C codes appears in the bottom left corner of the screen.
Release the "INPUT" button.



TV MODE



PC MODE

- Use the cursor buttons on the front control panel or on the remote control to perform adjustments.

- Press the UP or DOWN cursor to select the adjustment code.
- Press the LEFT or RIGHT cursor to change the data.
- Press the POWER button to store the data.

2. Adjustment Procedures

2.1 Adjustment of u-con clock.

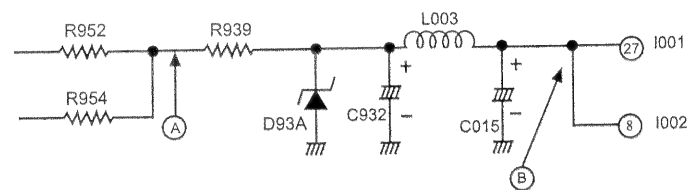


FIG. 1

- This adjustment should be done at power on mode.
- Confirm +15V (A) point.
- Connect frequency counter to I001 (12).
- Short I001 (9) pin with GND.
- Adjust C00T so that the clock frequency of I001 pin (12) is $125\text{KHz} \pm 2\text{Hz}$

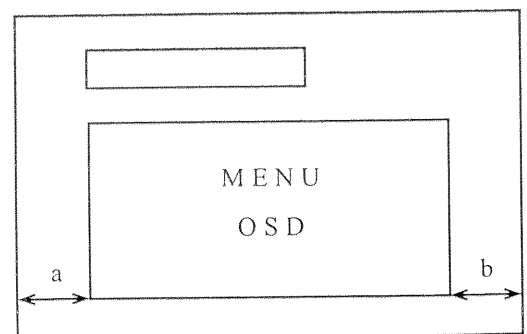
2.2 VCO for OSD adjustment.

Adjustment preparation

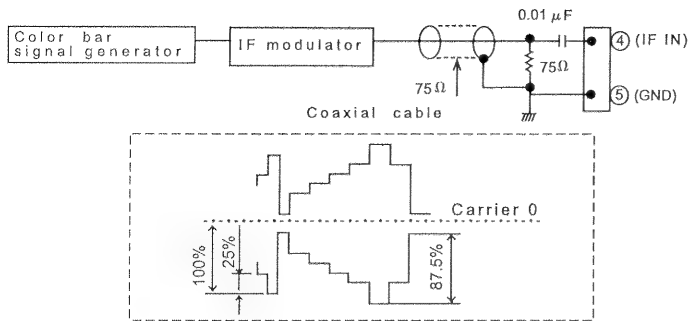
- Press menu button, and confirm menu OSD appears.

Adjustment procedure

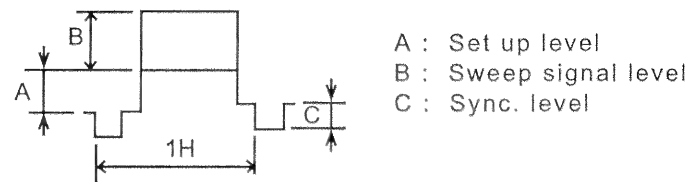
- Adjust L001 so as to be equal between "a" and "b" as shown below.



$$a = b$$



- (b) Connect oscilloscope to PIF2A (5) Pin. (TP-12)
Check the signal at TP-12 as follows.

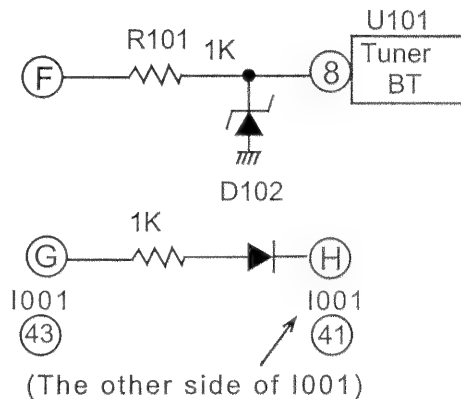
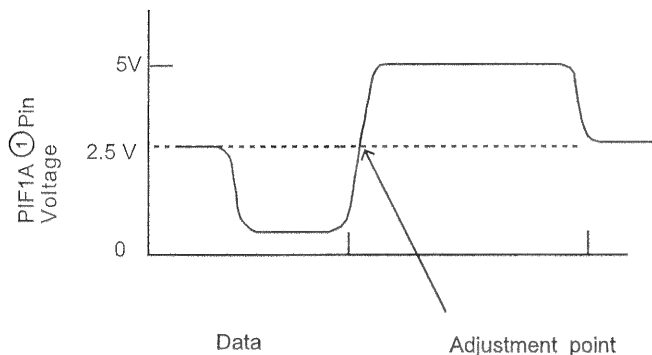


- (5) Connect DC voltmeter (Input Impedance 1M ohm or more)

Adjustment preparation.

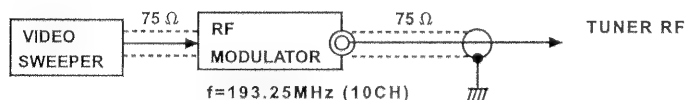
- (1) Adjust the PIF data "P01" so that the voltmeter is $2.5 \pm 0.5V$.
Adjustment point is the point at which the voltage changes suddenly with only "1" step in data changes.
- (2) The adjustment data should be written in EEPROM

PIF1A ① Pin performance



Adjustment procedure

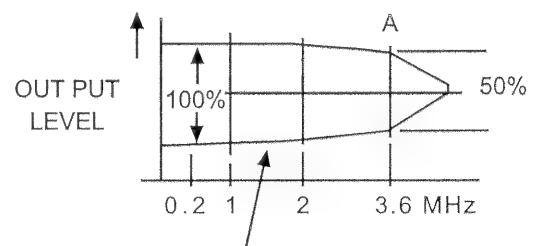
- (a) Adjust tuner IFT coil so that the output level of 0.2MHz is reference level (100%) and 3.6MHz level is 60% (At this time, do not turn tuner IFT coil more than 1 turn.)



Markers

0.2 MHz
1 MHz
2 MHz
3.6 MHz

Out put level : 91 ± 3 dBu (50ohm load)
Modulation : 90~70%



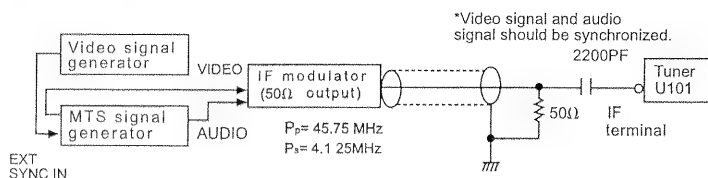
Check that 1MHz~2MHz level is 70%~100%.

4. MTS demodulating circuit adjustment.

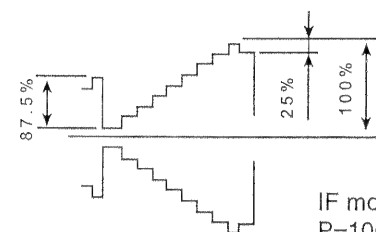
4.1 Input level adjustment (Adjustment code A04)

Adjustment preparation

- (1) Apply the signal to tuner (U101) IF input terminals of MAIN PWB using the jig shown below.



IF modulator output signal waveform
(Color bar or all white)



IF modulator output level and P/S
P=106dBu (50 ohm termination)
S level ; -3dB to P level
S/N ratio of F/Video output is 45dB or less.

Sound modulation condition

- Noise reduction encoder;ON
- Stereo signal;
 - (1) R=0 (L only), 300Hz, 30% modulation
 - (2) R=0 (L only), 3KHz, 30% modulation
- Monoaural signal ;
 - (3) monoaural, 400 Hz 100% modulation (PREEN OFF)
- SAPsignal ;
 - (4) SAP, 300HZ 30% modulation

- (2) Connect AC voltmeter to I402 pin (26). (TP-PVCO)
 - Use the AC voltmeter model VPS950C made by Matsushita.

Adjustment procedure

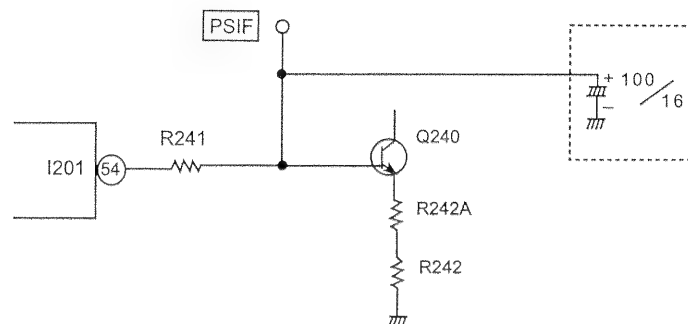
- (1) Select input signal (3) and adjust the data (A04) to $V_o = \text{signal } 500 \pm 10 \text{ Vrms}$.
- (2) Write the data into EEPROM I002

4.2 Stereo VCO adjustment (Adjustment code A01)

Adjustment preparation

- (1) Set-up is same as item 3.1.2.

- (2) Connect a frequency counter to I402 pin (26). (TP-PVCO)
Use a probe ratio of 1:1. ($R_i \geq 1 \text{M ohm}$, $C_i < 15 \text{pF}$)
- (3) No signal at I402 pin (7) input (PFIL).
- (4) Connect capacitor (100uF/16) as follows.
- (5) Select adjustment code A01



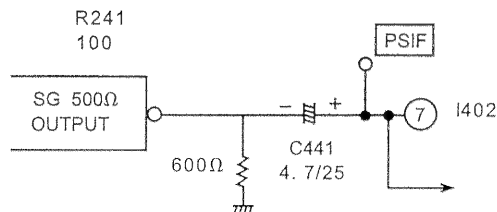
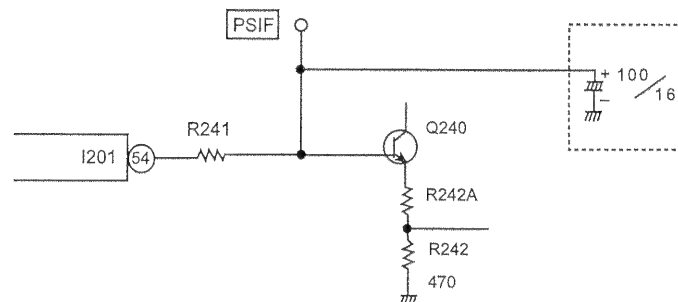
Adjustment procedure

- (1) Adjust the data to set $15.734 \pm 0.1 \text{ KHz}$.
- (2) Write the data into EEPROM (I002).
- (3) Remove capacitor (100uF/16).

4.3 Filter adjustment (Adjustment code A03).

Adjustment preparation

- (1) Connect a capacitor 100uF/16V as shown below.
- (2) Apply the signal to I402 pin (7) with the jig as shown below.



SG output signal spec.

- (1) FREQUENCY, $f = 15.734 \text{ KHz}$ (sin wave)
 $f = 15.734 \text{ KHz}$ (sin wave)
- (2) Signal level, $V = 100 \text{ mVrms}$.
 $V = 100 \text{ mVrms}$

- (3) Connect an AC voltmeter or oscilloscope to I402 pin (26) (TP-PVCO).
- (4) Select adjustment code "A03"

Adjustment procedure

- (1) Adjust the data so that the voltage of I402 (26) ([PVCO]) pin is minimum.
- (2) Write the data into EEPROM (I002).

4.4 Separation adjustment

(Adjustment code A05/A06")

(This adjustment should be done only after adjustment of items 3.2.)

Adjustment preparation

- (1) Set-up same as 3.2.1 (1).
- (2) Connect an AC voltmeter (or connect an oscilloscope.) to I402 pin (26) (TP-PVCO).

Adjustment procedure

- (1) (L separation adjustment)
Select sound input signal (1) and adjust the data of "A05" so that 300Hz level is min..
- (2) (H separation adjustment)
Select sound input signal (2) and adjust the data of "A06" so that 3KHz level is min.
- (3) Repeat (1) and (2) so the adjustment accuracy is within+1dB from min. point.
- (4) Write the data into EEPROM (I002).

4.5 SAP VCO adjustment (adjustment code "A02")

Adjustment preparation

- (1) Connect an frequency counter to I402 (26) (TP-PVCO).
- (2) Set-up same as item.

Adjustment procedure

- (1) Adjust the data of "A03" so that the frequency is $78.67 \pm 0.5\text{KHz}$.
- (2) Write the data into EEPROM (I002).

5. Cut off adjustment(TV mode)

Adjustment preparation

- (1) Connect an oscilloscope to R.G.B. output. (see Table 1)
- (2) Receive CROSS-HATCH pattern signal.

	PIF1A
R output	⑪ pin
G output	⑫ pin
B output	⑬ pin

Table 1

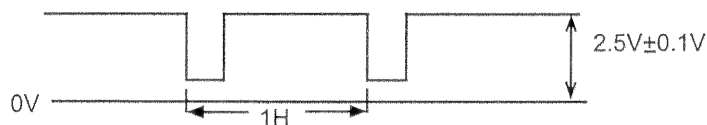
Adjustment procedure

- (1) Select red cut-off adjustment code "P03".
- (2) Adjust the cut-off data as that the output waveform is $2.5 \pm 0.1\text{V}$.
- (3) Write the data to EEPROM (I002).
- (4) Perform the same procedure for G and B.(see Table 2 for adjustment codes.)

Adjustment Code

Data	Sub address
R cut off	P03
G cut off	P04
B cut off	P05

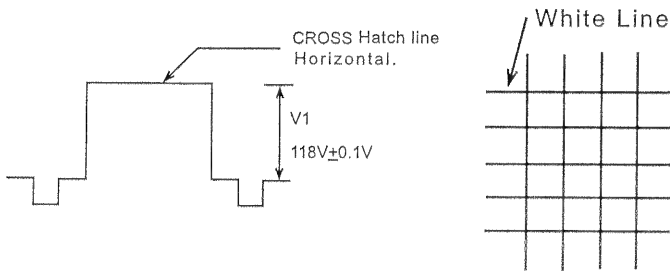
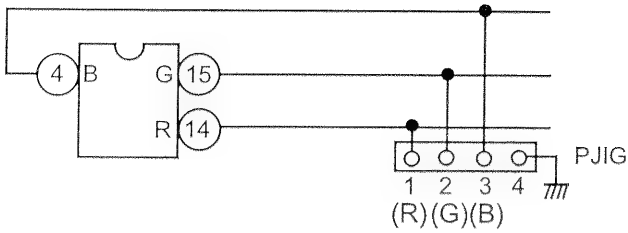
Table 2



6. PC mode. RGB Gain Adjustment.

Adjustment preparation/procedure

- (1) Connect an oscilloscope to PJIG connector pin (1) on the CPT PWB. (Red).



Data	Codes
PC R-Gain	P 12
PC G-Gain	P 13
PC B-Gain	P 14

Table 3: PC R/G/B Gain Adjustment Codes

- (2) Connect PC "VGA" output to the "VGA" input at the rear of the TV set.
- (3) Select PC mode.
- (4) Receive a Cross-Hatch Signal.
- (5) In PC mode, set the contrast to max.
- (6) Adjust "P12" data so that $V1=1.8V\pm0.1V$.
- (7) Write the data to the EEPROM (I002).
- (8) Perform the same procedure to adjust G and B Gain. (See Table 3 for the codes).

7. Initial setting and operation checking.

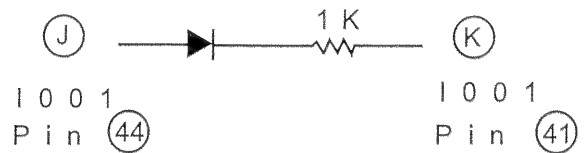
7.1 Initial setting.

S- IN	<input type="radio"/>	1
POWER ON1	<input type="radio"/>	1
POWER ON2	<input type="radio"/>	1
V-CHIP	<input type="radio"/>	1
PC-MOUSE	<input type="radio"/>	1
27/20	<input type="radio"/>	1

OSD TABLE

Checking procedure

- (1) Connect diode (1SS270TA or 1S2076) to (J) ~ (K)

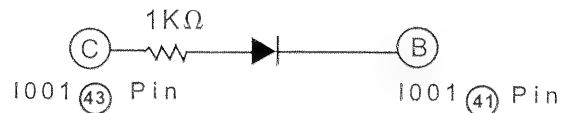


- (2) Confirm OSD settings (shown in the above) to appear.
- (3) Remove diode. After this operation, each setting should be initialized setting automatically.
- (4) Check if beep is heard after initializing.

7.2 Clock operation check

Checking preparation

- (1) Connect a Diode (IS2076 or ISS270TA) and a 1Kohm JIG. between points (C) and (B).

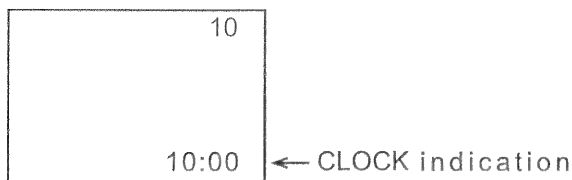


Remark: This diode changes clock 60 times quicker than normal.

- (2) Select CLOCK SET from the OSD and set the clock to eg. 10:00.

Checking procedure

- (1) After clock setting is finished exit the OSD.
- (2) Press recall to display the clock.
- (3) Check that the minutes changes every second.



- (4) Remove JIG.

7.3 AFC operating check

Checking preparation

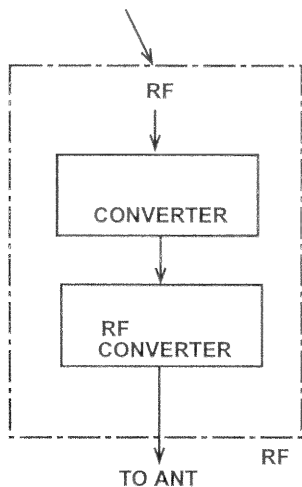
- (1) Connect the jig shown below to the ANT terminal.

Checking procedure

- (1) Receive a standard carrier (not offset) with channel up/down or direct selection buttons. Check that it is pulled into the standard tuning point.
- (2) Receive an offset signal of +1.5MHZ. Check that it is pulled into the standard tuning point. (Perform the channel selection operation again.)
- (3) Receive an offset signal of -1.5MHZ. Check that it is pulled into the standard tuning point. (Perform the channel selection operation again.)

(note 1) Modulation signal, circle pattern or a color bar signal, can be used.

(note 2) Checking Jig (All channel converter can be used)



8. PC mode deflection circuit adjustment.

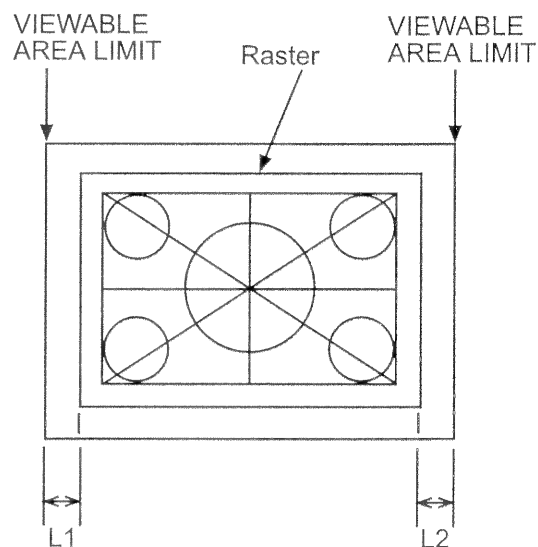
8.1 Raster center adjustment.

Adjustment preparation

- (1) Receive CROSS HATCH with CIRCLE pattern from a PC.

Adjustment procedure

- (1) Adjust R791 so that L1 and L2 are even.



- (2) Increase the PC-OSD Brightness control so the raster edge is visible.

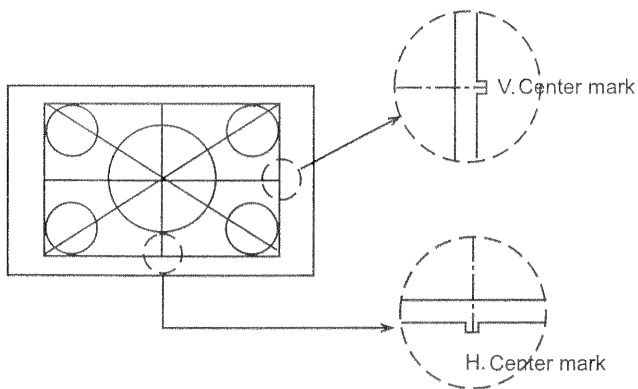
8.2 H&V position coarse adjustment.

Adjustment preparation

- (1) Receive CROSS HATCH with CIRCLE pattern from a PC. In PC mode and set CONTRAST MAX. and others center.
- (2) The set should be face the north or south.
- (3) Select adjustment code "D12"-V. center.

Adjustment procedure

- (1) Adjust vertical center by changing data as the figure below
- (2) Select adjustment code "D13".
- (3) Adjust horizontal center as shown in the fig. below.



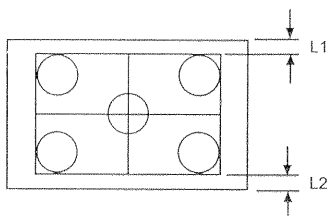
8.3 Vertical size adjustment.

Adjustment preparation

- (1) Receive CROSS HATCH and CIRCLE pattern from a PC. In PC mode set CONTRAST MAX. and others center.
- (2) The set should be face the north or south.
- (3) Select adjustment code "D14".

Adjustment procedure

- (1) Adjust vertical size as the figure below, by changing data.



	(Unit ;mm)
Set name	L1, L2
27MM20B	15±5mm

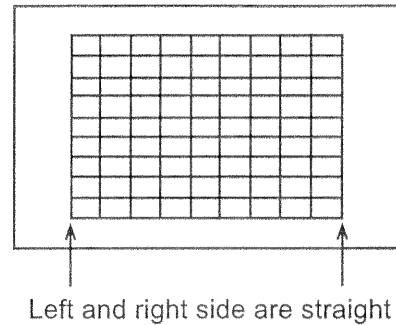
8.4 Pin cushion distortion adjustment.

Adjustment preparation

- (1) Receive CROSS HATCH with CIRCLE pattern from A PC. In PC mode set CONTRAST max. and others center.
- (2) The set should be face the north or south.
- (3) Select adjustment code "D06".

Adjustment procedure

- (1) Adjust pincushion distortion as the figure below, by changing data.



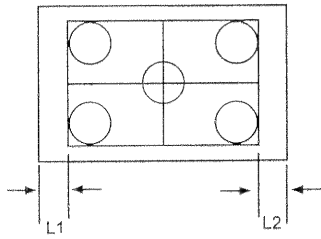
8.5 Horizontal size adjustment.

Adjustment preparation

- (1) Receive CROSS HATCH with CIRCLE pattern from A PC. In PC mode set CONTRAST max. and others center.
- (2) The set should be face the north or south.
- (3) Select adjustment code "D15".

Adjustment procedure

- (1) Adjust Horizontal size as the figure below, by changing data.



	(Unit ;mm)
Set name	L1, L2
27MM20B	20±5mm

8.7 70Hz mode adjustment.

Adjustment preparation

- (1) Receive CROSS HATCH with CIRCLE pattern from a PC. In PC mode and set CONTRAST MAX. and others center.
- (2) The set should be face the north or south.

Adjustment procedure

- (1) Adjust vertical center and size as the figure ADJUSTMENT CODE by changing data.

V center "D12"

V size "D14"

8.6 Corner and Trapezoid distortion adjustment.

Adjustment preparation

- (1) Receive CROSS HATCH pattern from a PC. In PC mode set CONTRAST max. and others center.
- (2) The set should be face the north or south.

Adjustment procedure

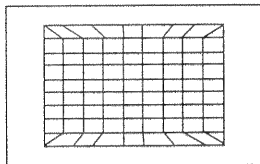
- (1) Adjust these distortion like the figure below, by changing data.

Adjustment codes

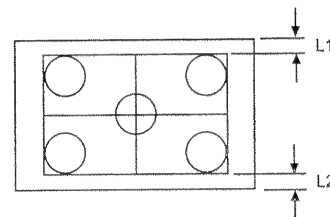
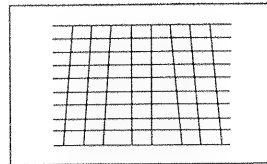
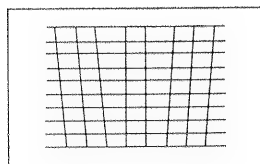
Corner Distortion "D07"

Trapezoid Distortion "D08"

CORNER DISTORTION



TRAPEZOID DISTORTION



	(Unit ;mm)
Set name	L1, L2
27MM20B	15±5mm

9. TV mode deflection circuit picture adjustment.

9.1 H-center adjustment.

Adjustment preparation

- (1) Apply heat-run 30 min. or more after the power is turned on.
- (2) Receive circle pattern signal with left and right side markers.
- (3) Set CONTRAST max. and others center.
- (4) Select adjustment code "D12".

Adjustment procedure

- (1) Adjust horizontal center so that deference of right and left size marker is with in 0.5, pitch.

9.2 Vertical center and size adjustment.

Adjustment preparation

- (1) Apply heat-run 5 min. or more after the power is turned on.
- (2) Receive circle pattern signal, and set CONTRAST max. and others center.
- (3) The set should be face the north or south.

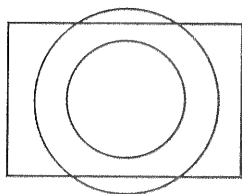
Adjustment procedure

- (1) Adjust vertical center and size so that the outer circle pattern is like the figure below, by changing data.
Adjustment code

V center "D16"

V size "D01"

1/2 of the width of outer circle comes to the screen.



9.4 Horizontal size adjustment.

Adjustment preparation

- (1) Receive circle pattern signal with right and left side markers.
- (2) Set CONTRAST to max. and BRIGHT to center.
- (3) Select adjustment code "D05".

Adjustment procedure

- (1) Adjust so horizontal size markers at the left and right sides to be within 1.5 pitch.

9.5 Corner and Trapezoid adjustment.

Adjustment preparation

- (1) Receive CROSSHATCH signal and set CONTRAST to max. and BRIGHT to the point where the back ground is set.

Adjustment procedure

- (1) Adjust these distortion like the figure below, by changing data.

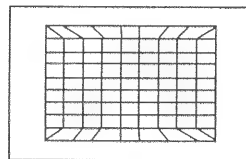
Corner Distortion "D07"

Custom code	1DH
Data code	00H~0FH
Data bit	D3~D0

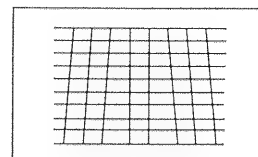
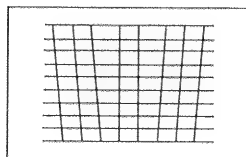
Trapezoid Distortion "D08"

Custom code	1EH
Data code	00H~3FH
Data bit	D5~D0

CORNER DISTORTION



TRAPEZOID DISTORTION



9.3 Pincushion distortion adjustment.

Adjustment preparation

- (1) Receive CROSS HATCH signal and set CONTRAST to max. and BRIGHT to the point where the background is set.
- (2) Select adjustment code "D06".

Adjustment procedure

- (1) Adjust side pincushion distortion so that the line of the right and left is straight by changing data.

10. White balance adjustment

10.1 PC mode

Cut-off, High Light & Low Light Adjustment

Adjustment preparation

- (1) Apply heat-run 20 min. before any adjustment
- (2) Verify purity adjustment has been complete
- (3) Set the user controls as follows:
 - Contrast = maximum
 - Bright = center
 - Sub-bright(P15)=95
- (4) Turn low brightness white balance adjusting VRs (R866, R868, R870) fully counter-clockwise
- (5) Turn VRs (R860, R8864) to their mechanical center
- (6) Turn the Screen VR fully counter-clockwise
- (7) Receive a black raster signal.

Adjustment procedure

- (1) Activate the cut-off line (adjustment code P12 + Menu)
- (2) Turn the screen VR clockwise and set to the position where the bright colored line start appearing on the CPT screen. Do not turn thereafter the low brightness white balance VR(A) corresponding to the color first appearing.
- (3) Turn the low brightness white balance VRs (R866, R868, R870) and adjust so that red, green and blue bright colored lines appear on the screen equally.
- (4) Turn the screen VR fully counter clockwise and then clockwise to the position where the line just appears.
- (5) Return to the normal mode (press 'Menu')
- (6) Set the user controls as follows:
 - Contrast = 80% of its OSD range
 - Brightness = center
- (7) Receive program a white raster signal
- (8) Adjust VRs (R860, R864) so that the x & y coordinates of the Color Analyzer displays as:
 - x=0.284 y=0.296
- (9) Set Contrast minimum
- (10) Verify that the x & y coordinates of the Color Analyzer displays as:
 - x=0.284 y=0.296
- (11) If not, adjust VRs (do not touch VR(A)) (R866, R868, R870) so that the x & y coordinates of the Color Analyzer displays as:
 - x=0.284 y=0.296
- (12) Repeat step 6, step 8 and finish

10.2 Sub-Bright level adjustment (PC mode)

Adjustment preparation

- (1) Apply heat-run at least 20 minutes before any adjustment
- (2) Set the user controls as follows:
 - Contrast = maximum
 - Brightness = maximum
- (3) Receive program a black raster signal.

Adjustment procedure

- (1) Activate the sub-bright (adjustment code P15)
- (2) Adjust sub-bright to 15 cd/m²
- (3) Return to the normal mode (press 'Power' to store)

10.3 TV mode

Cut-off, High Light & Low Light Adjustment

Adjustment preparation

CAUTION:

[THIS ADJUSTMENT SHOULD BE DONE AFTER ADJUSTMENT OF PC MODE WHITE BALANCE AND SUB-BRIGHT, AND NEVER TURN THE SCREEN VR.]

Adjustment preparation

- (1) Apply heat-run at least 20 minutes before any adjustment.
- (2) Verify that PC mode white balance adjustment is done.
- (3) Set the user controls as follows.

Contrast = maximum
Brightness = center
Color = cool
Set P08 = 00

- (4) Receive white raster signal.

Adjustment procedure

- (1) Activate the Red cut-off line (adjustment code P03 + Menu)
- (2) Adjust so that Red line just appears.
- (3) Go to the Green cut-off line (adjustment code P04)
- (4) Adjust so that Green line just appears.
- (5) Go to the Blue cut-off line (adjustment code P05)
- (6) Adjust so that Blue line just appears.
- (7) Return to the normal mode (press 'Menu' and then 'Power')
- (8) Receive white raster signal
- (9) Set the user controls as follows:
 - Contrast = 80% of its OSD range
 - Brightness = center
- (10) Adjust the Green drive (adjustment code P06) and the Blue drive (adjustment code P07) so that the x & y coordinates of the Color Analyzer displays as:
 - x=0.284 y=0.296
- (11) Return to normal mode (press 'Power')
- (12) Set Contrast minimum
- (13) Verify that the x & y coordinates of the Color Analyzer displays as:
 - x=0.284 y=0.296
- (14) If not, adjust service code P03, P05 so that the x & y coordinates of the Color Analyzer displays as:
 - x=0.284 y=0.296
- (15) Repeat step 9 to step 11 and finish

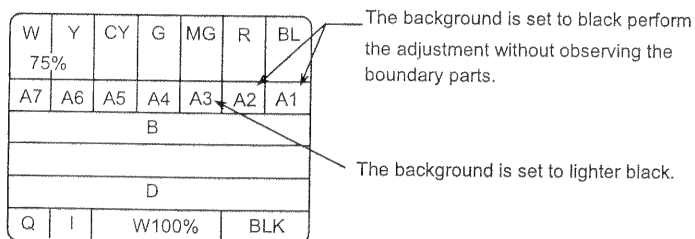
10.4 Sub-Bright level adjustment (TV mode)

Adjustment preparation

- (1) Apply heat-run 20 min. or more after the power is turned on.
- (2) Receive a color bar signal.
- (3) Set CONTRAST and color controls to min.
- (4) Set the vertical incident illumination on the CPT surface to 20 lux or less.
- (5) Set BRIGHT control to the center position.
- (6) Set white control to COOL.
- (7) Select adjustment code P08.

Adjustment procedure

- (1) Adjust the background of A1, A2 are set to black and A3 is set lighter black by SUB-BRIGHT DATA .



- (2) Check by directly observing the CPT surface, without using a mirror.

11. AGC adjustment.

Adjustment preparation

- (1) After all the adjustment are finished, heat-run 5 minutes or more with a color bar signal.
- (2) Set PICTURE to Max. and BLACK LEVEL to center.

- (3) Antenna input level;-51dBm
- (4) Connect DC voltmeter (impedence 1Mohm or more) to PAGC pin.
- (5) Select adjustment code "P02"

Adjustment procedure

- (1) Adjustment AGC data until the indication of DC volt meter does not change any more at the maimum point. the reading of DC voltmeter is named V1. Adjust AGC data so that the indication of DC voltmeter is {V1-(0.5+0.2)}V.

12. Setting for delivery

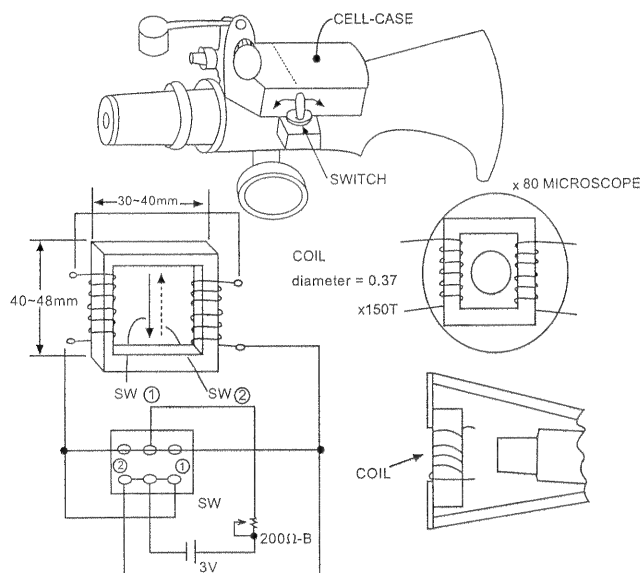
Name	27MM20B
SIGNAL SOURCE	Antenna
RECEPTION CHANNEL	03 CH
SOUND VOLUME (VOLUME)	"10" On-screen display
INPUT SELECT	TV mode
CONTRAST	Max.
COLOR	Center
TINT	Center
BRIGHT	
SHARPNESS	Center
COLOR TEMP.	Cool
BALANCE	Center
BASS	Center
TREBLE	Center
MTS MODE	Stereo
LOUDNESS	Off
VOLUME CORRECTION	No setting
AUTO NOISE CANCEL	Off
INT.SP	On
CLOSED CAPTION	Off
CLOSED CAPTION MODE	C.C
CLOSED CAPTION CHANNEL	1
MENU language	English
CHANNEL ID	No setting
FAMILY Favorites	No setting
CHILD Lock	No setting
CLOCK Set	No setting
CHANNEL Memory	03~13CH
ON/OFF Timer	No setting
Message	No setting
H Position (PC)	Center
H size (PC)	Center
V Size (PC)	Center
V Position (PC)	Center
Contrast (PC)	48 step
Brightness (PC)	Center

13. PURITY/ CONVERGENCE ADJUSTMENT

13.1 Adjustment Preparation

- (1) Keep DY stuck to CPT funnel.
- (2) Turn ON the set and receive cross-hatch signal (or circle pattern signal). Adjust the static convergence coarsely according to item (VIII, 1-4).
- (3) Receive circle pattern signal and adjust the white balance according to item 4-11.
- (4) Set BRIGHTNESS control and CONTRAST control to maximum and apply heat-run to the with circle pattern signal received for 40 min or more.

Reference



Fix coil to CRT side of microscope. Set it upside down and measure it. Check that beam moves to the right and left equally in quantity. Be careful at assembly that core does tilt because upwaward (downward) magnetic field by coil moves the beam to the right (left) or type MS-50X microscope of KANSAI DENKI.

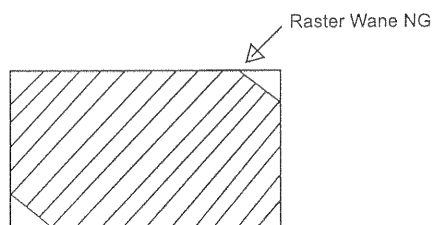


TABLE 1

CPT	T
A68KSA30X(D)	40 Min.

The magnetic field in artificial magnetic field should follow the table below and the set should face as in Table 2. Degauss it from outside.

DESTINATION	VERTICAL FIELD	HORIZONTAL FIELD
USA	0.45 G	0.3 G
CANADA	0.54 G	0.15 G
UNIVERSAL	0.35G	0.3 G
PANAMA, HAWAII	0.2 G	0.3 G

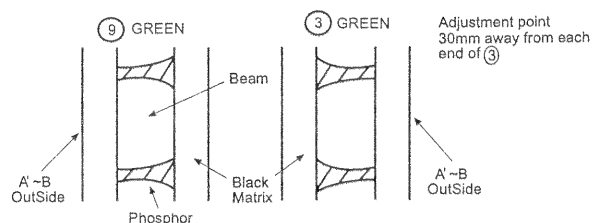
13.2 Preparation

THIS ADJUSTMENT METHOD APPLIES TO THE PURITY ADJUSTMENT BY USING MICROSCOPE.

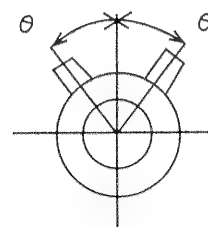
- (1) Adjust coarsely White balance, Static convergence (center) and Focus.
- (2) Receive circle pattern and heat-run more than T minutes with CONTRAST and BRIGHTNESS to maximum. Do not delete the raster nor vary the current before fixing the position of DY. Heat-run should be done with perfect raster. (DY and tilt should have been coarsely adjusted.)
- (3) Set microscope with wobbler coil to CRT face. Check that the beams moves to right and left equally.

NOTES:

- (a) Open the purity magnet as follows in order to move the raster only in the right-left direction to center the picture white keeping the landing at (3) and (9) positions.
- (4) Adjust the purity magnet and DY to obtain the landing at (3) and (9) as below.

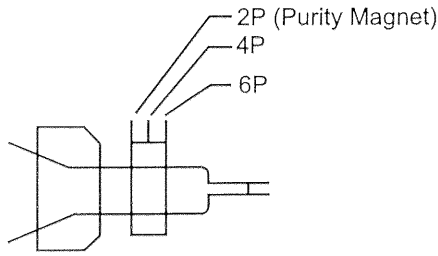


- (a) Open the purity magnet as follows in order to move the raster only in the right-left direction.

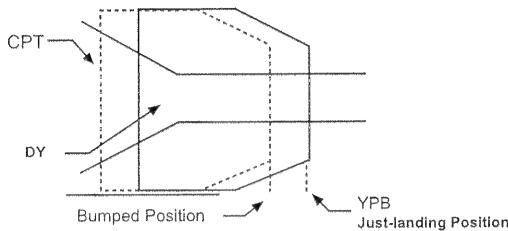


C-F MAGNET

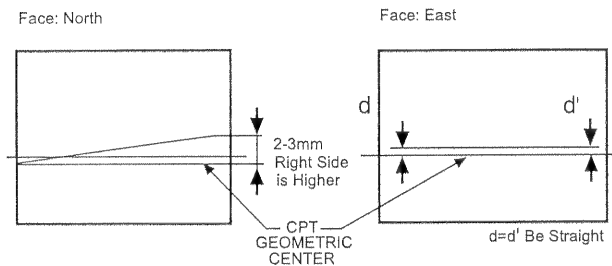
Keep the balance of ③ / ⑨ DY landing



- (b) YPB (Yoke pull-back) should be as follows,
(Distance between the bumped position of DY toward the funnel and the just-landing position of ③ and ⑨.)



- (C) DY tilt should be as follows.



- (5) Fix DY with fixing torque of 14g.cm.
- (6) If any miss landing occurs, correct with magnets.
If mislanding is 10u or so, judge by white unevenness.
At this time, if the white unevenness is all right, magnet is not needed.
- (7) After peripheral convergence is adjusted, check the position of DY and tighten the DY again. (14g.cm)
- (8) Purity check
The magnetic field in artificial magnetic field should follow the magnetic field according to the destination, and the set should face as follows.
After degaussing in each direction, check these items visually and with a microscope.
 - (a) No problem in white unevenness.
 - (b) Each single color must not hit any other colors.
 - (c) If white or each single color is defective, apply a magnet(s) on CPT for correction.
If any magnet is applied, check it after degaussing.

13.3 Purity Adjustment

(This adjustment method applies to purity adjustment by hand operation.)

- (1) Use an artificial magnetic field and set the field strength as follows.
*Magnetic field in CPT axis direction: 0 Gauss
*Magnetic field which is vertical to CPT axis:
U.S.A., Hawaii, Panama, Guam
Bolivia, Peru, Universal.....0.3 Gauss
Canada.....0.15 Gauss
Taiwan.....0.37 Gauss
(The direction of the magnetic field should be from the left side to the right side of the CPT screen as you face it.)
- (2) Adjust Focus coarsely.
- (3) Adjust Convergence coarsely according to item 1-4 and 1-5.
- (4) Receive Circle Pattern signal and check that Contrast and Brightness are maximum.
- (5) Receive magenta signal. When the magenta signal is not available, short-circuit between the base and emitter of Q855 and set to magenta.
- (6) Press DY fully against CPT funnel and turn the purity magnet so that the vertical magenta band comes to the center of the picture (Fig. 1-3-1). Check that color unevenness of both sides are approximately equal at this time. The openings of the purity magnet should be symmetric (Fig. 1-3-2).

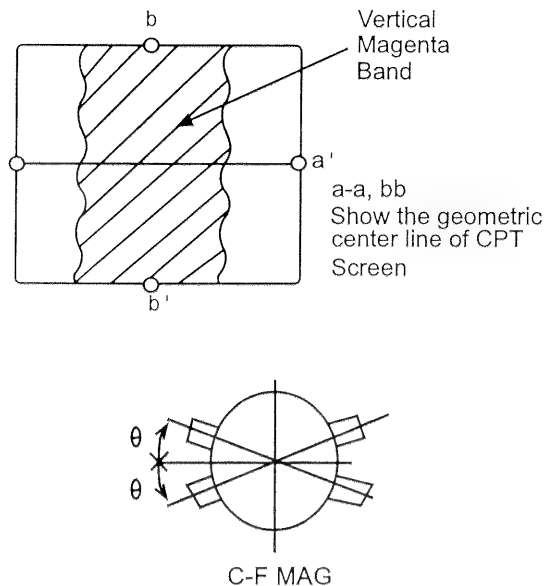


FIGURE 1-3-2

- (7) Receive the single red signal.
When the single red is not available, short-circuit between the base and emitter of Q845, and between the base and emitter of Q857 and set to single red.
- (8) Pull back DY gradually and when the color unevenness of both sides of the picture disappear, mark the rear edge position of DY on the tape in the same way. At this time, pull back DY until color unevenness starts to appear. Also mark this position.

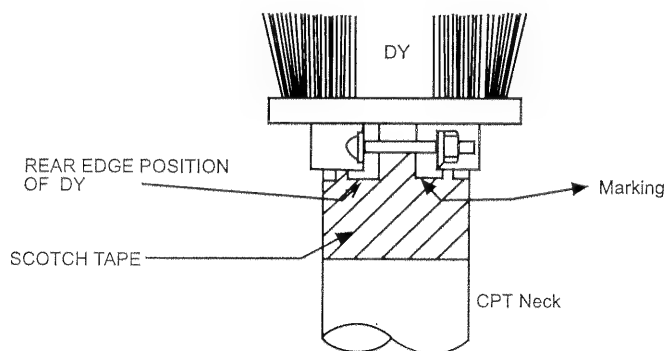
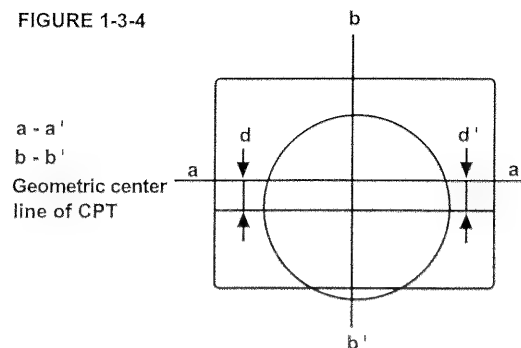


FIGURE 1-3-3

- (9) Move DY so that the rear edge position of DY comes to the center of the two marked lines and fasten DY as $d=d'$ (Figure 1-3-4). Further insert the rubber wedge between DY and CPT funnel from the top and raise DY.

FIGURE 1-3-4



- (10) Set CPT axis direction magnetic field of the artificial magnetic field setting list classified by destination. (The direction of the magnetic field should be from the CPT screen side to the neck side.) After degaussing it from outside, check the purity in each color to R, G, and B visually. Then, turn the screen to white and check the landing at the screen position shown in Fig. 1-3-5 with a microscope.
- (11) Criteria with microscope
There should be no miss landing at positions 2, 4, 8 and 10.
Green beam should be at center of the green phosphor at position C.

- (12) Turn over the direction of CPT axis direction magnetic field of next artificial magnetic field and check it by the same way as item (11). The positions of miss landing criteria with a microscope should be 2, 4, 8 and 10 (Figure 1-3-5).

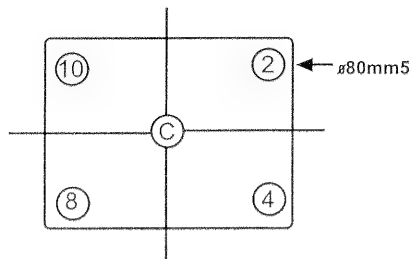
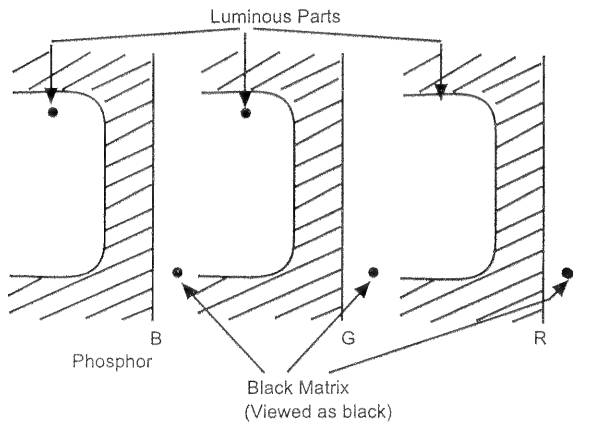


FIGURE 1-3-5

Miss landing criteria

The following conditions are defined as miss landing. Each color beam shines on the phosphor of the applied color, and there are phosphor parts which are not luminous (shaded parts in the figure below) between the luminous parts and black matrix.



- (13) To improve the miss landing mentioned above, it's acceptable to stick the permanent magnet to CPT funnel (Figures 1-3-7 and 1-3-8).

Usage

Apply a silicon rubber KE-40 WRTV to the permanent magnet shown in the Figure, adhere it to the CPT funnel and then fix it with permacel tape P212.

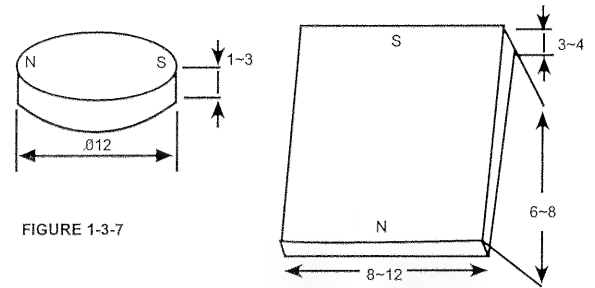
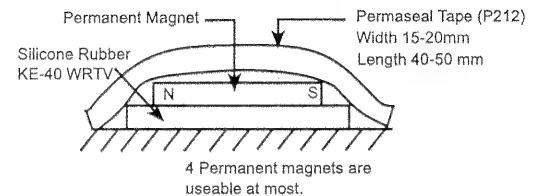


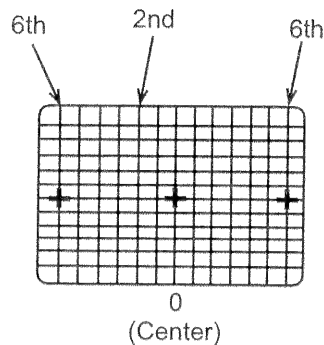
FIGURE 1-3-7



- (14) Final purity criteria should satisfy the miss landing criteria.
- (15) When delivering the sets, set CPT axis direction magnetic field to 0 Gauss and degauss it from outside.

13.4. Focus Adjustment

NO.	MODEL	CPT	Condition	Focus VR setting position
1	27MM20B	A68KSA30X (D) (HED-US)	<ul style="list-style-type: none"> • Recieve the cross-hatch signal for PC mode. • Set user control to memory initialize. 	Turn the Focus VR gradually clockwise from the full counterclockwise position. Then set it to the point where the focus of the 6th vertical line from the screen center becomes best.



13.5 Static Convergence Adjustment

- (1) Receive a cross-hatch signal and set Brightness to the center and Contrast to minimum.

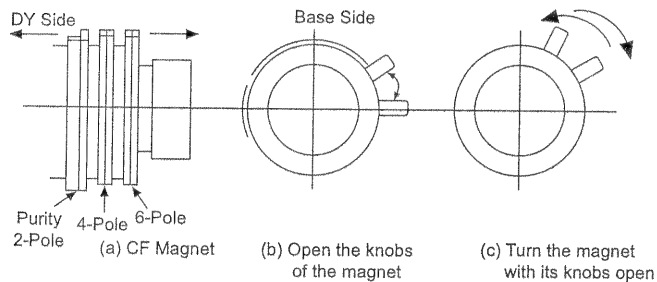
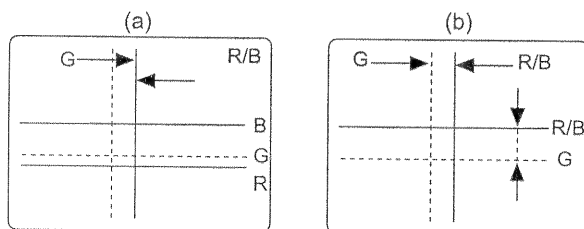


FIGURE 1-4-2

- (2) Open the knobs of 4-pole magnet (2 sheets) (Figure 1-4-1(b)) and match the blue/red vertical lines at the center of the screen as shown in Figure 1-4-2(a).
- (3) Turn the 4-pole magnet with its knobs open (Figure 1-4-1(c)) and match the blue/red horizontal lines as shown in Figure 1-4-2(b).



13.6 Dynamic Convergence adjustment

- (1) Insert an adjustment wedge (temporary) between the top of DY opening and CPT funnel as shown in Figure 1-5-1.
By inserting the wedge gradually, match the red and blue vertical lines at the top and bottom of the screen and also match the red and blue horizontal lines of both sides of the screen as shown in Fig. 1-5-2(a).
- (2) Adjust by swinging in the right/left directions of DY while observing 6 and 12 horizontal lines of the screen and match the red and blue horizontal lines.
As shown in Fig. 1-5-2(b), when the blue is outside from the red on CPT screen, insert the DY fixing wedge between the right-side DY viewed from the rear of CPT and CPT funnel.
- (3) As shown in Fig. 1-5-2(c), when the blue is inside from the red on CPT screen, insert the wedge between the left-side DY and CPT funnel.
- (4) Insert two DY fixing wedge with approximately 120 to the fixing wedge inserted in item (2) or (3) and remove the adjustment wedge (temporary). Use the DY fixing wedge after peeling off the tape. After proper location, press and adhere it to the funnel.

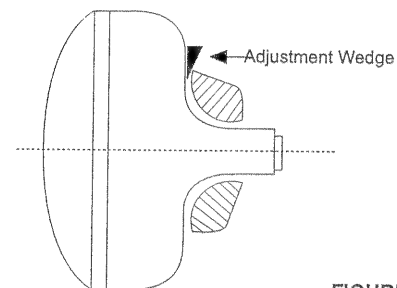
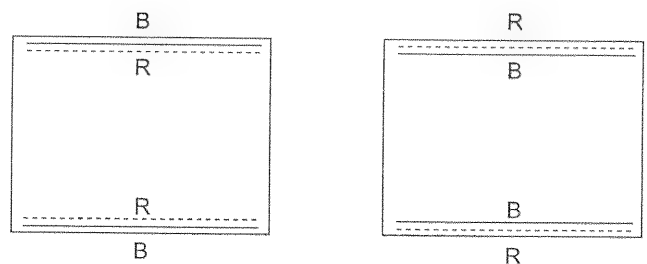
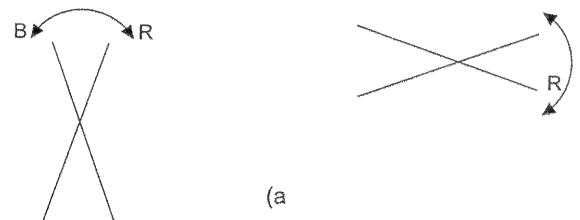


FIGURE 1-5-1

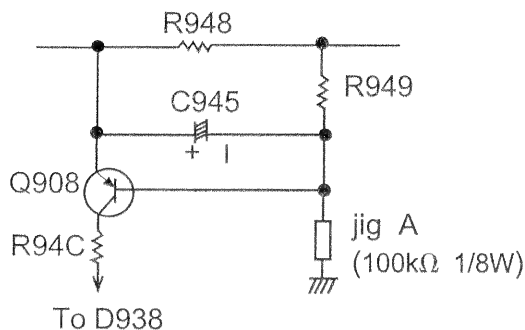


14. Protection Circuit Check

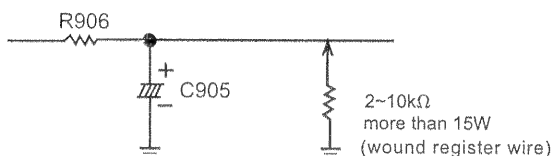
14.1 FBT protection circuit operation check.

Checking Preparation

- (1) Set "Contrast" to Max, "Bright" to Center.)
Checking Procedure
- (2) Connect jig A between Q908 base and grand,
check that picture disappears.



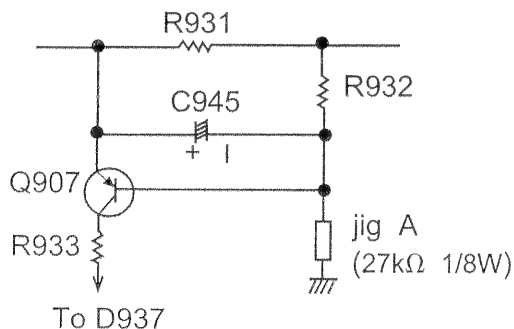
- (2) Immediately after checking, Disconnect the power cord of the set.
- (3) Discharge C905 as follows.



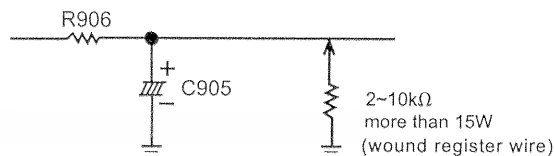
14.2 Check +15V short protection circuit.

Checking Preparation

- (1) Connect jig A between Q907 base and grand,
check that picture disappears.



- (2) Resistor immediately and the power cord.
- (3) Discharge C905 as follows.



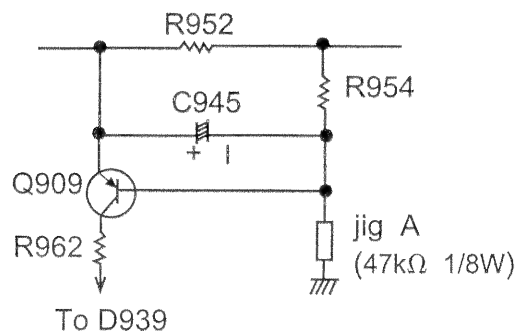
14.3 Check +14V short protection circuit.

Checking Preparation

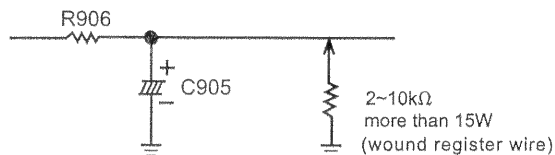
- (1) Contrast Max, Bright Center.

Checking Procedure

- (1) Connect jig A between Q909 base and grand,
check that picture disappears.



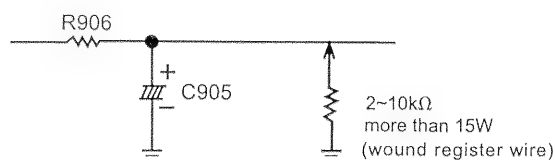
- (2) Resistor immediately and the power cord.
- (3) Discharge C905 as follows.



14.4 Load short protection circuit operation check.

Checking Procedure

- (1) Receive Hitachi circle pattern signal.
- (2) Set "Contrast" max, Bright Center.
- (3) After turning on the switch of the set.
Confirm the DC voltage of D021 each cathode side.
These voltage should be 6V+1.0V.
- (4) Short-circuit the both ends of R091 and check that
the picture disappears within 2~3 sec..
- (5) Disconnect short-circuit for r091 and the power cord.
- (6) Discharge C905 as follow.



Circuit Descriptions

1. ET TUNER (ET-452A)

This chassis uses a 181 channel ET tuner in which the tuner section and channel selector PLL section (prescaler built-in) are made into one unit.

Figs. 1-1 and 1-2 shows its composition.

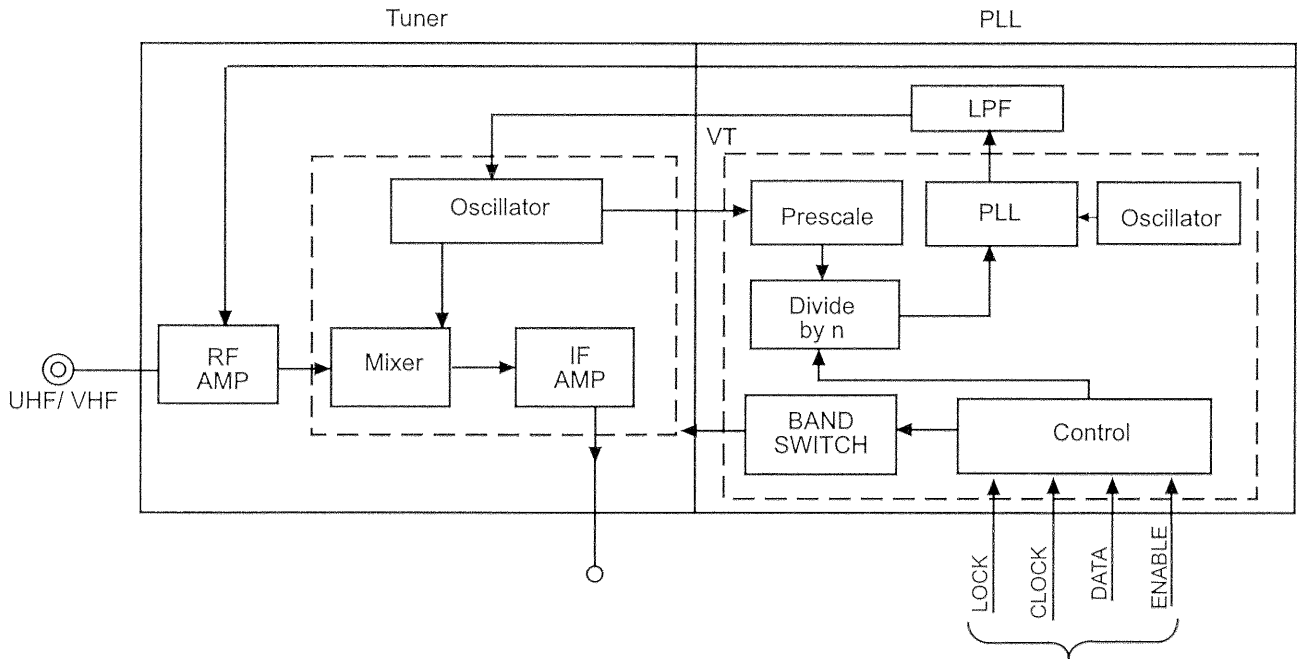


Fig. 1-1 Block diagram of the ET Tuner

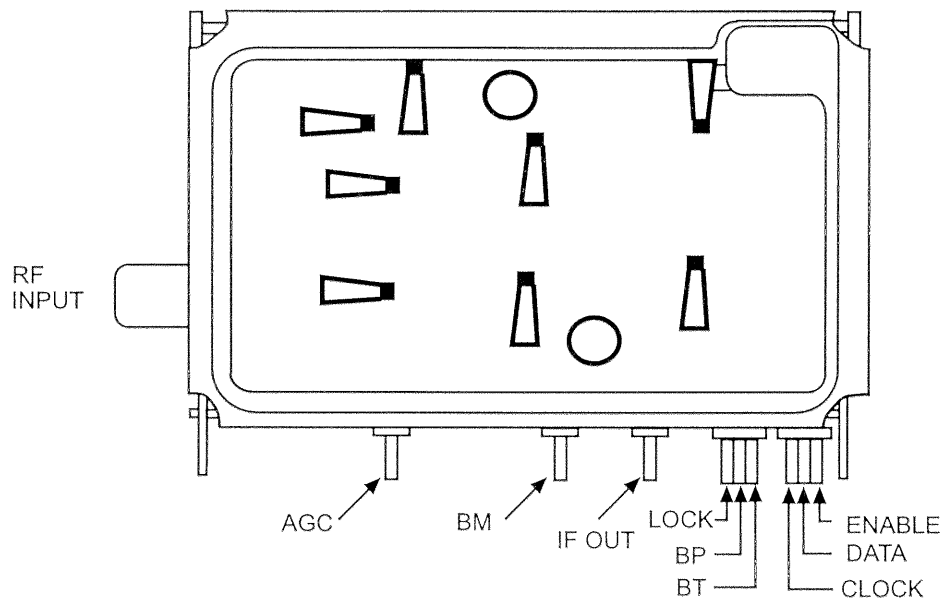


Fig. 1-2 ET Tuner (ET-452A)

2. POWER SUPPLY

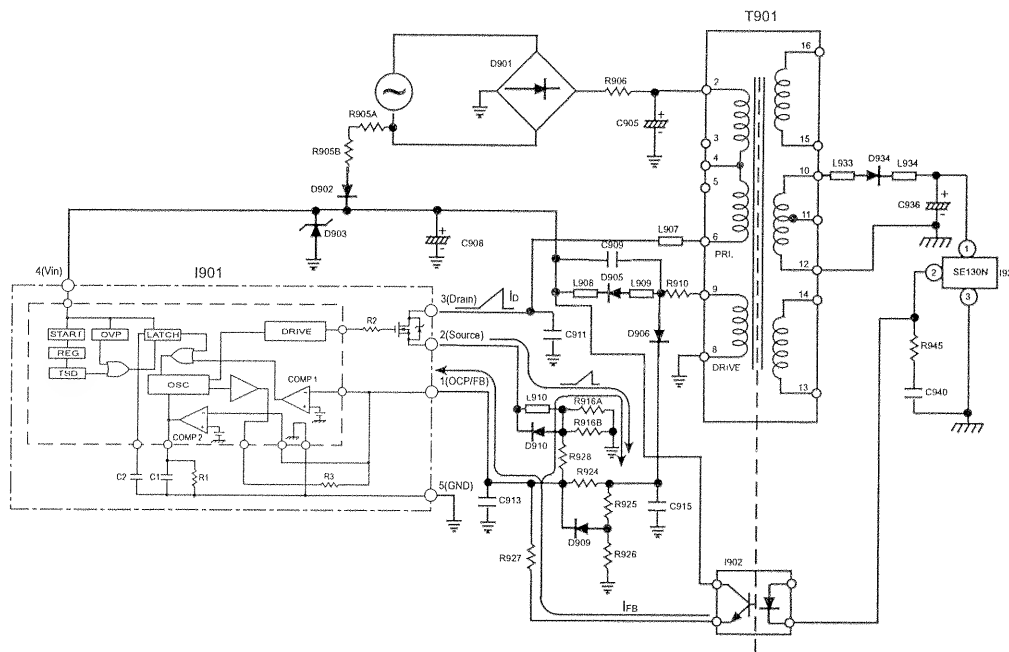


FIG.2. I901 and its related circuits

When the unit is connected to the AC line, the AC voltage is rectified by D901, charging C905 through the current limiting resistor R905, resulting in 170VDC across the primary winding of T901. Fig.2 shows the primary supply circuit.

2.1. I901 START UP CIRCUIT

Diode D902 is used to provide about 16V for I901 pin 4(Vin) to start I901. After the control circuit starts, the Vin voltage starts to decrease. The 170 volts at the primary winding of T901 induces a voltage in the drive winding (pins 8 and 9). This is rectified by D905 and charges C908 to a potential above the shutdown voltage of I901 Vin(10V). This voltage is added to the Vin to provide stability, keeping I901 operating.

2.2. I901 SWITCHING OPERATION.

The internal oscillator of I901 drives an internal MOSFET. The MOSFET drain current I_d , flows across R916A/B. During the ON time, the internal capacitor C1 is charged to 6.5V. Terminal 1(OC/FB) threshold voltage is 0.73 ~1.37V typical. When pin 1 reaches the threshold voltage of 0.73V, the internal comparators turns the MOSFET off, and C1 discharges to approx. 3.7V. During the OFF time(50uS typical), the energy in T901 is released, and the quasi-resonant signals developed in the drive winding are added to pin 1 of I901(via a Delay circuit D906, D909, R924, R925, R926 and C915) along with the control voltage to keep the MOSFET in its OFF state.

Function of some external components:

1. **C911**- Resonance capacitor to smooth the rising edge of the pulse voltage developed at the MOSFET (D) pin 3.
2. **D910/L910**- D910 reduces switching loss in the OFF-state. L910 performs the same function in the ON-state.
3. **C5** reduces noise at the turn on of the MOSFET.

2.3. I901 OUTPUT REGULATION CIRCUIT.

The drain current I_d of the MOSFET output is controlled by a feedback current(I_{fb}) obtained via I902 from the +B error amplifier I931 on the secondary side of T901. The voltage at I931 pin 2 is directly proportional pin 1. Any variations in the voltage at pin 1 due to load changes causes variations at pin 2. Since it is the peak value of the MOSFET I_d that is detected at the OCP/FB terminal of I901 to control its oscillator output, the I_{fb} is added to the I_d . When the peak value of the I_d changes, the oscillator switching frequency changes to stabilize the MOSFET output which in turn stabilizes the +B voltage at the secondary side of T901.

2.4. I901 OVERCURRENT PROTECTION(OCF)

This is a pulse by pulse detection of the peak value of the drain current (I_d). The voltage drop across R916A/B between the source terminal (pin 2) and GND is input to the OCP terminal. The OCP operation voltage is set above the threshold of 0.73V. When an over current condition is sensed due to some excessive load on the secondary side, a voltage drop occurs between the source terminal and GND to decrease the gate drive voltage and reduce the output switching current of the MOSFET.

2.5. I901 OVERVOLTAGE PROTECTION(OVP).

This circuit functions as protection of the Vin terminal against over voltage since it is supplied from the drive winding of T901. The OVP operation voltage is 22.5V typical. This internal circuit triggers an internal latch circuit and stops operation when the Vin terminal voltage exceeds 22.5V. When the latch circuit is ON, the Vin terminal voltage fluctuates between 10~16V (typ.). To release the latch circuit, disconnect the AC input supply by removing the AC line cord.

2.6 I901 THERMAL SHUTDOWN CIRCUIT.

This circuit triggers the latch circuit(as described in item 2.5 above) when the case temperature exceeds 140C.

2.7 T901 SECONDARY SUPPLY VOLTAGES.

SUPPLY VOLTAGE	SOURCE	RECTIFIER	REGULATOR
1. +130V	T901(PIN#10)	D934	I901
2. +15V	T901(PIN#16)	D932	-----
3. +14V	T901(PIN#14)	D936	-----
4. +12V-S	+14V	-----	Q914
5. +5V	+14V	-----	-----
6. +12V	+14V	-----	Q707
7. +9V	+12V	-----	Q705

2.8 STAND-BY POWER SUPPLY.

In stand-by mode the +14V supply is used to provide +5V for I001 Vcc. I001 remains in stand-by mode until the power button is pressed.

When the power is turned on, I001 pin (31) goes high, and Q783 conducts and Q782 is cut-off. Q781(H-Vcc +12 regulator) conducts, providing +12V for H-Vcc. The H-Vcc supplies IN71 the H/V osc. and I201 to start the deflection circuits.

2.9 PROTECTION CIRCUITS.(See Fig. 2-1)

2.9.1 HIGH VOLTAGE HOLD DOWN CIRCUIT.

The 56V line from the FBT is used to detect HV variations. If the HV rises to an unsafe level, D719 conducts. Q905(G) rises to 0.7V and conducts to provide a return path for I904. I904 will conduct and cause Q901 to latch, stopping I901 operation. The unit will remain in this state until the AC supply line is disconnected.

PROTECTION CIRCUIT -DETECTION COMPONENTS FOR Q901,Q905.

ITEM	DETECTION COMPONENT
+B (overvoltage)	D940, D941
FBT(+B overcurrent)	Q908, D938
+14V	Q909, D939
+15V	Q907, D937
HV	D719
I601(V.out)	D702
VT	D703, I001
+25V	D717, I001
+5V-2	DN92, I001
+5V	D021, I001
+9V	D020, I001

2.9.2 I001 PROTECT DETECTION.

The protect line is connected to the protect in pin (8) of I001. When a low is detected at pin (8) for more than 2 seconds, pin(32) the protect out line goes high.D009 conducts and triggers Q905 and Q901.

PROTECTION CIRCUITS

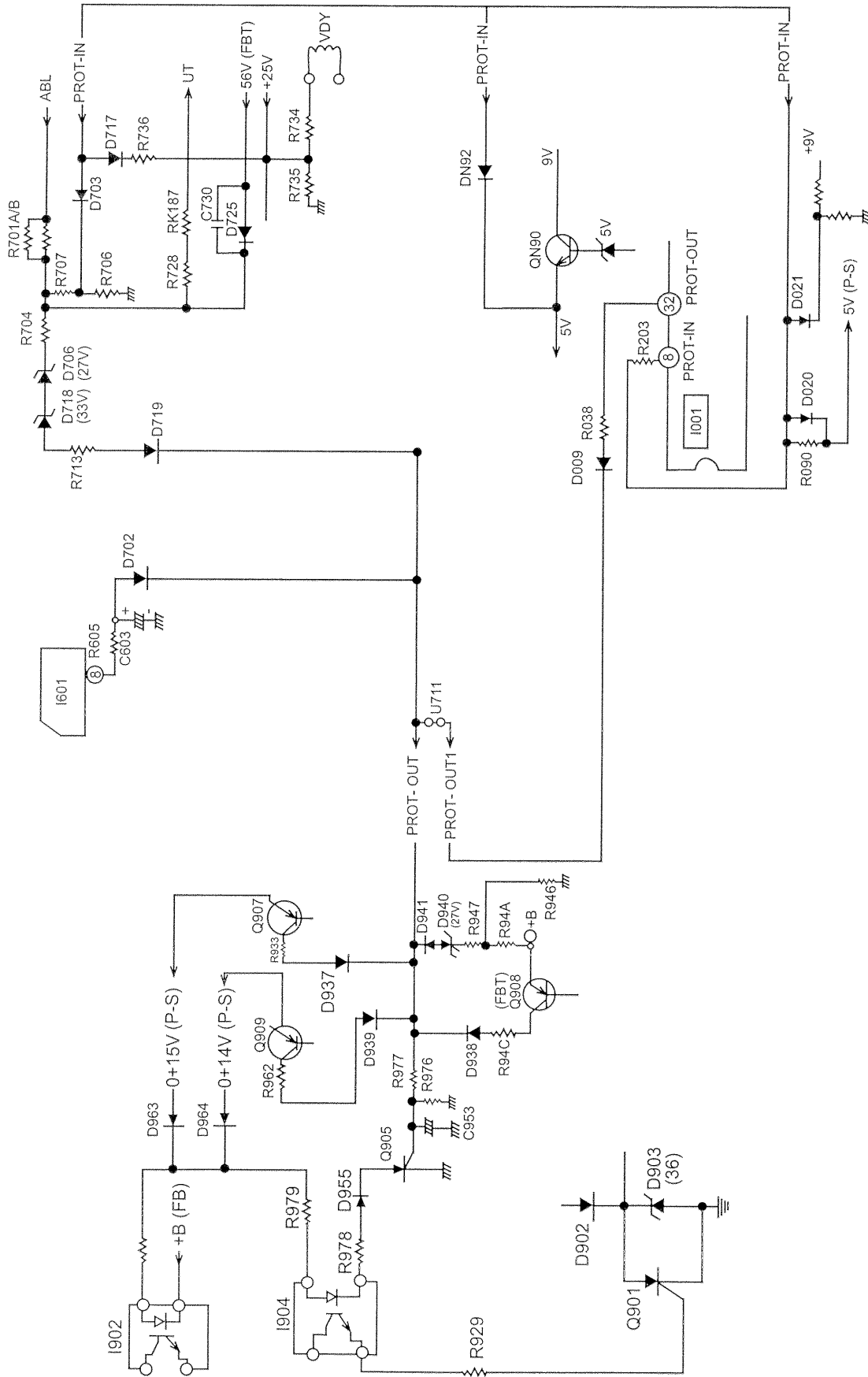
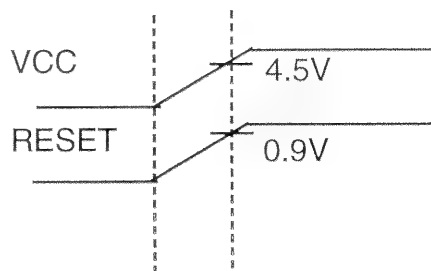


Fig. 2-1

3. Microprocessor I001 (M3721MF-2115P) Pin Descriptions. (see fig.3)

3.1 I001 PIN FUNCTIONS.

- (1) This is the input for the H. Sync. signal for OSD.
- (2) This is the input for the V. Sync. signal for OSD.
- (3) AFC AD input from I201 (44).
- (4) Interrupt request line from Mouse control IC IY02.
- (5) 15KHz input from TV-VIDEO
- (6) 31KHz input (PC-H) when PC is selected.
- (7) NC
- (8) Protection circuit (approx. 2V or less).
When a low is detected (approx. 2V or less) the protection output pin (32) is set to high.
- (9) INPUT- for front control keys
Ch. UP =1.0V INPUT=3.5V
Ch. DOWN=1.6V Menu=4.1V
Vol. UP =2.2V
Vol. Down =2.9V
- (10) TV/PC3- mode switching line. This output is +5V when PC mode is selected.
- (11) Cont. PC.- This is PC mode contrast control. The output voltage range is 0V to 2.8V
- (12) BEEP.- This sound is activated when memory is initialized.
- (13) 60/70Hz- This signal switches vertical sync. in PC mode for 60Hz or 70Hz.
640x480(H=31.7KHz, V=60Hz)Pin(13) 0V
640x480(H=31.7KHz, V=70Hz)Pin(13) 4V
- (14) Enable - When the channel selector buttons are pressed this pin output a "High" to the tuner to select channels.
- (15) RC IN - This is the input for remote control signals from the R/C receiver "U001"
- (16) V-State - This is the data communication - 10Nline for IY02 (Mouse Controller).
- (17) H-State -
This is the clk communication line for IY02 (Mouse Controller).
- (18) VCC +5V input for analog circuit operative
- (19) HLF, (20) RVCO
This pin provides connection to an extreme RC filter for internal "timing signal generating" circuit of the CCD slicer.
- (21) V Hold
This pin provides connection for an external capacitor for the "reference voltage generating" circuit of the CCD slicer.
- (22) CVIN is the input for the composite video for CCD.
- (23) CNVSS is connected to GND
- (24) XIN (25) XOUT
These pins are connected to an external oscillator circuit for the internal clock circuit when power-on this xin clock start oscillation. In stand-by the oscillation frequency is 32 KHz. With the TV set on and CCD on, oscillation frequency is 8MHz.
- (26) GND
- (27) VCC +5V Input
- (28) OSC IN (29) OSC OUT
These pins are connected to an external LC circuit to provide a clock for OSD.
- (30) RESET
When the power is turned on, a reset is initiated to perform RAM check and read last data input to the EEPROM.
The reset pin is held "L" (0.9V or less) for Approx. 3us until the VCC and AVCC rises to 4.5V or more. IC I003 (Reset IC) functions to keep the reset voltage "L" while the input power source rises. The timing is set by C051, C018, and R037



- (31) POWER**
When power is turned on, this pin goes “H” to switch Q783 and Q782 to obtain H-VCC from Q781 to start the horizontal and vertical oscillators.
- (32) PROTECT-OUT**
This pin is “L” at normal operation. When a “L” is detected at pin (8) “Protect In” for more the 2 seconds, this pin (32) goes “H” to operate the protection circuit.
- (33) TV/PC2**
This pin switches TV-RGB/PC-RGB and TV Audio/PC-Audio.
In TV mode it is “H”
In PC Mode it is “L”
- (34) Input**
This pin switches TV video and audio between RF, S-video, and A/V inputs.
In TV mode it is “L”
In Vdeo mode it is “H”
In PC-MODE it is “L”
- (35) TV/PC1**
This pin switches TV and PC H/V sync. Selector IC IN6A.
In TV mode it is “L”
In PC Mode it is “H”
- (36) Data**
This pin is the input to detect H/V sync. in PC mode. The H/V sync. comes IN01 (sync. processor IC)
- (37) SDA1**
This is the data in/out for I2C communication.
- (38) Clock**
This is the input to detect H/V Sync. polarity in PC mode.
- (39) SCL1**
This is the clock for I2C communication
- (40) Intensity (Half Tone)**
When OSD is on-screen, this pin is “H”. It switches Q581 to reduce the level of the background video.
- (41) Matrix-out (42) Matrix-In1**
These are the inputs for the power button on the control panel, to turn the tv set on or off
- (43) Matirx - IN2 (44) Matrix-IN3**
Inputs for H/V State
- (45) H. Center**
This is a PWM signal used to vary the H center in PC Mode. This signal goes to IC IN41 which controls the H.phase.
- (46) INt. Sp**
This turns the internal speakers on or off. When the speakers are on, this pin is “L” When the speakers is set to “Off” this pin is “H” and switches Q411 to mute I403 (Audio output).
- (47) P. Blk**
This pin mutes the video when changing channels or selecting A/V inputs or PC Mode.
- (48) MUTE**
This is the output signal used to mute the audio when changing channels. When the Mute button is pressed, this pin is set to “H” and switches Q411 to mute I403.
- (50) OSD-R (51) OSD-G-(52) OSD-B**
This is the OSD output for both TV-OSD and PC-OSD. TV-OSD is sent to I201 (Video/Chroma) and PC-OSD is sent to I551 (RGB SW).

I001 (M3721MF-211SP) Pin Descriptions

1	HSYNC	OSD_R	52
2	VSYNC	OSD_G	51
3	AFC	OSD_B	50
4	PS-REQ	OSD_BLK	49
5	15KHz	MUTE	48
6	31KHz	P_BLK	47
7	NC	INT-SP	46
8	PROTECT_IN	H_CENT	45
9	AD_IN	MATRIX_IN3	44
10	TV/PC3	MATRIX_IN2	43
11	CONT-PC	MATRIX_IN1	42
12	BEEP	MATRIX_OUT	41
13	50/70	INTENSITY	40
14	ENABLE	SCL1	39
15	RC-IN	CLOCK	38
16	V-STATE	SDA1	37
17	H-STATE	DATA	36
18	VCC	TV/PC1	35
19	HLF	INPUT	34
20	RVCO	TV/PC2	33
21	VHOLD	PROTECT-OUT	32
22	CVIN	POWER	31
23	CNVSS	RESET	30
24	XIN	OSC_OUT	29
25	XOUT	OSC_IN	28
26	GND	VCC	27

FIG. 3

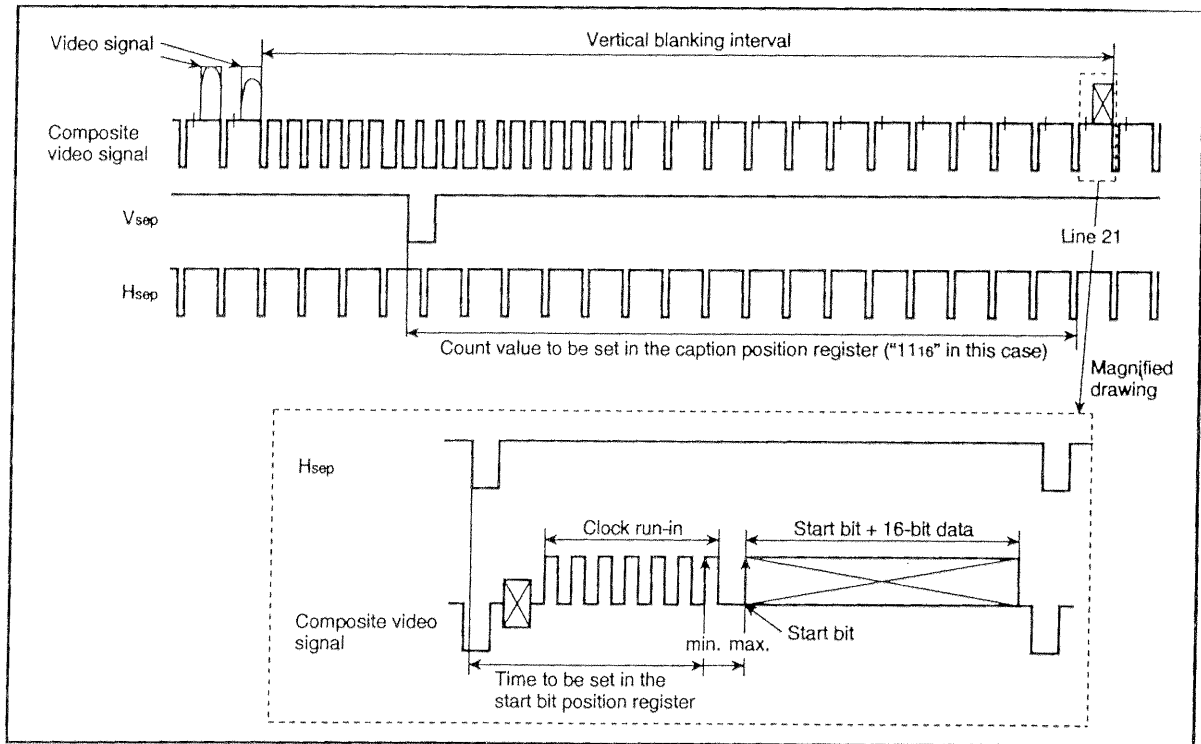


Fig. 3.1

3.2 CLOSED CAPTION DECODING(I001)

I001 includes a data slicer for CCD operation. The Data Slicer removes the caption data superimposed in the vertical blanking interval (line 21) of the composite video signal. (see fig. 3.1 and 3.2)

1. CLAMP AND LOW PASS FILTER.

This filter attenuates noise on the composite video signal. An external low pass filter is also used for this purpose (C042, R034, and R036).

2. SYNC. SLICER.

This circuit removes the composite sync.

3. SYNC. SIGNAL SEPERATION CIRCUIT.

This circuit separates the horiz. and vert. sync from the composite sync.

4. TIMING GENERATING CIRCUIT.

This circuit generates a ref. clock signal and other timing signals. This ref. clock signal is used for the data slicer and the OSD functions.

5. DATA SLICE LINE SPECIFICATION CIRCUIT.

The counter is reset at the falling edge of the V.sync. at increments of every 1 H.sync. pulse. When the counter value matches the specified value of the Caption position register, this H.sync. is sliced.

6.1 REFERENCE VOLTAGE GENERATING CIRCUIT.

This circuit generates the slicing voltage using the amplitude of the Clock Run-in pulse.

6.2 COMPARATOR.

This compares the voltage of the composite signal with the ref.(V) in 7.1. to convert the composite video into digital value.

7. START BIT DETECTING CIRCUIT

The first rising video is detected as a start bit by sampling the comparator output.

8. CLOCK RUN-IN CIRCUIT.

The Clock Run-in portion in the composite video is set by this circuit, and is determined by counting the number of pulses in the window.

9. DATA CLOCK GENERATING CIRCUIT.

16 data clock pulses are generated with the start bit to turn on the data slicer.

10. 16 BIT SHIFT REGISTER

The digital caption data converted by the Comparator is stored in this register, and read out by the data registers 1 and 2 to the data bus line and sent to the OSD circuit.

11. CCD WINDOW.

The boundaries of the CCD display on the screen is determined by the High and Low registers of the OSD circuit

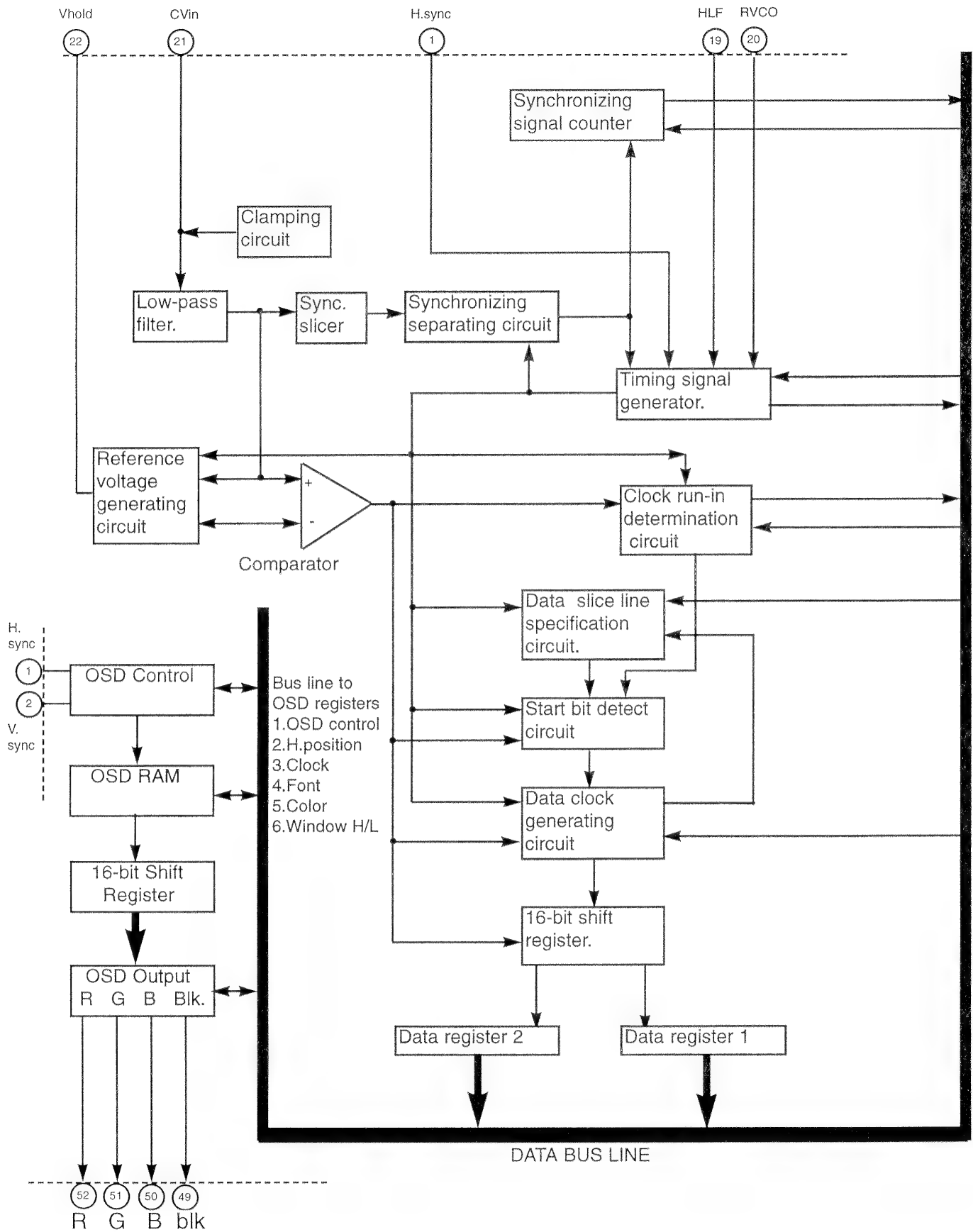
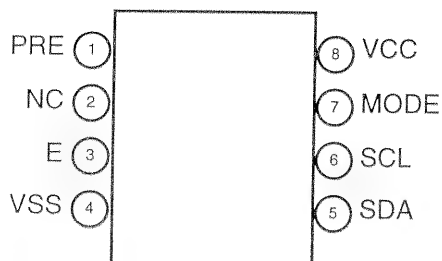


Fig. 3.2 I001 INTERNAL CCD BLOCK DIAGRAM

4. Memory IC I002 (ST24C08FB6)

The ST24C08FB6 ic is an 8k electronically erasable/programmable memory (eeprom), organized as 4 blocks of 256 x 8 bits. The memory is compatible with the I2C standard.



PIN#	SYMBOL	DESCRIPTION
1	PRE	Write protection enable
2	NC	
3	E	Chip enable input
4	VSS	GND
5	SDA	Serial data I/O
6	SCL	Serial clock
7	MODE	Multiple page write mode
8	VCC	Supply voltage

4.1 DEVICE OPERATION

I2C Bus Background

The ST24C08FB6 IC supports the I2C protocol. This protocol defines any device that sends data onto the bus as a transmitter and any device that reads the data as a receiver. The device that controls the data transfer is known as the master and the other as the slave. The master will always initiate a data transfer and will provide the serial clock for synchronization. The ST24C08FB6 acts as the slave device.

Start Condition:

START is identified by a high to low transmission of the SDA line while the clock SCL is stable in the high state. A Start condition must proceed any command for data transfer. Except during a programming cycle, the ST24C08FB6 continuously monitor the SDA and SCL signals for a Start condition and will not respond unless one is given.

Stop Condition:

STOP is identified by a high to low transition of the SDA line while the clock SCL is stable in the high state. A stop condition terminates communication between the ST24C08FB6 and the master. A Stop condition at the end of the Read command forces standby state. A Stop condition at the end of the write command triggers the internal EEPROM write cycle.

Acknowledge Bit (ACK) :

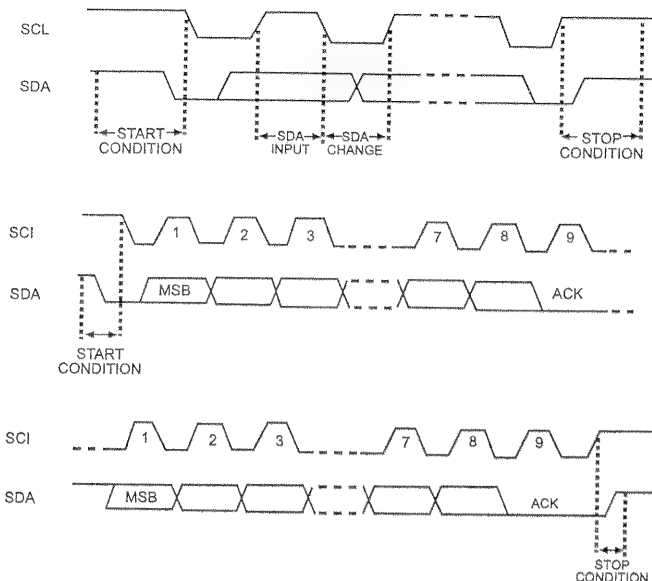
An acknowledge signal is used to indicate a successful data transfer. The bus transmitter, either master or slave, will release the SDA bus after sending 8 bits of data. During the 9th clock pulse period the receiver pulls the SDA bus low to acknowledge the receipt of the 8 bits of data.

Data Input:

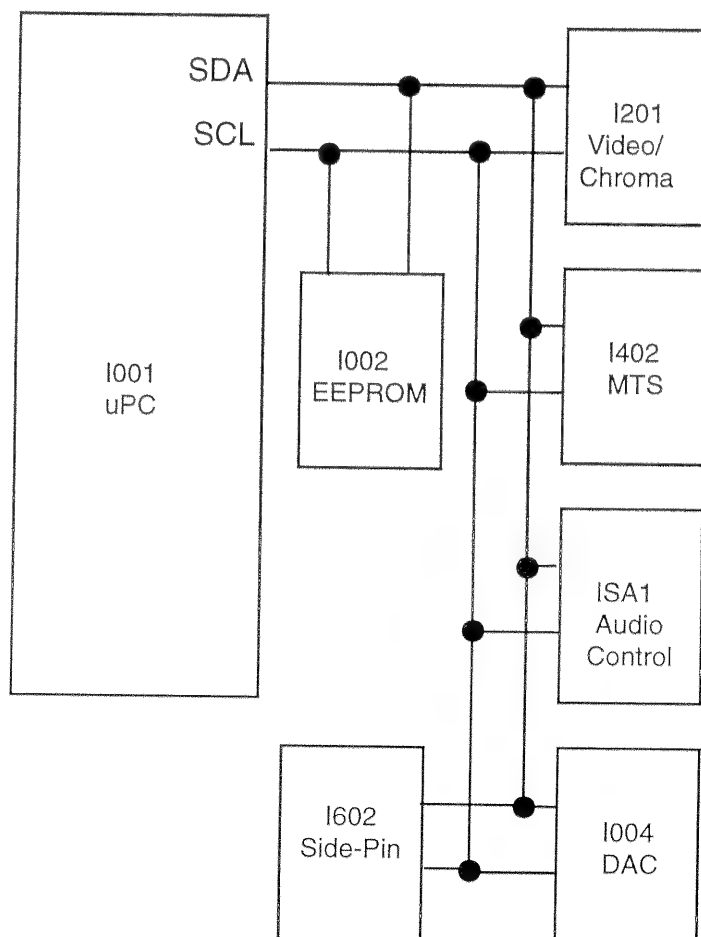
During the data input the ST24C08FB6 sample the SDA bus signal on the rising edge of the clock SCL line is low.

Memory Addressing:

To start communication between the bus master and the slave ST2408FB, the master must initiate a start condition. Following this, the master sends onto the SDA bus line 8 bits (MSD first) corresponding to the device select code (7 bits) and a READ or Write bit.



4.2 I2C Communication lines



(see Fig. 5.1 and 5.2)

The microcomputer for mouse control is IY02 (M37470M4, an 8-bit controller). I001 the main u-con is the master and IY02 is the slave. Communication between the PC, I001, and IY02 is through Bi-directional Serial Bus of TTL level.

QY44 and QY45 are switches to send clk and data signals to PC via the I/O pins of the jack (JMS).

IY02 pin#18 is the reset. IY03 is the reset IC which holds pin#18 "L" for 2uS or more until the VCC rises to approx. 5V.

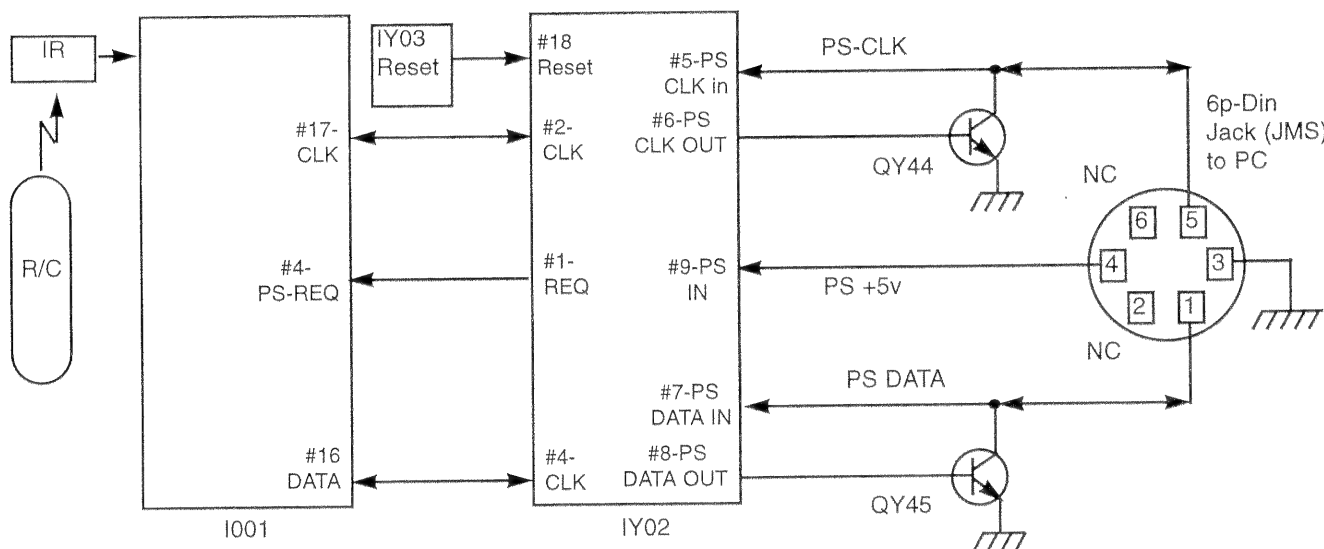


Fig. 5.1 SYSTEM BLOCK DIAGRAM

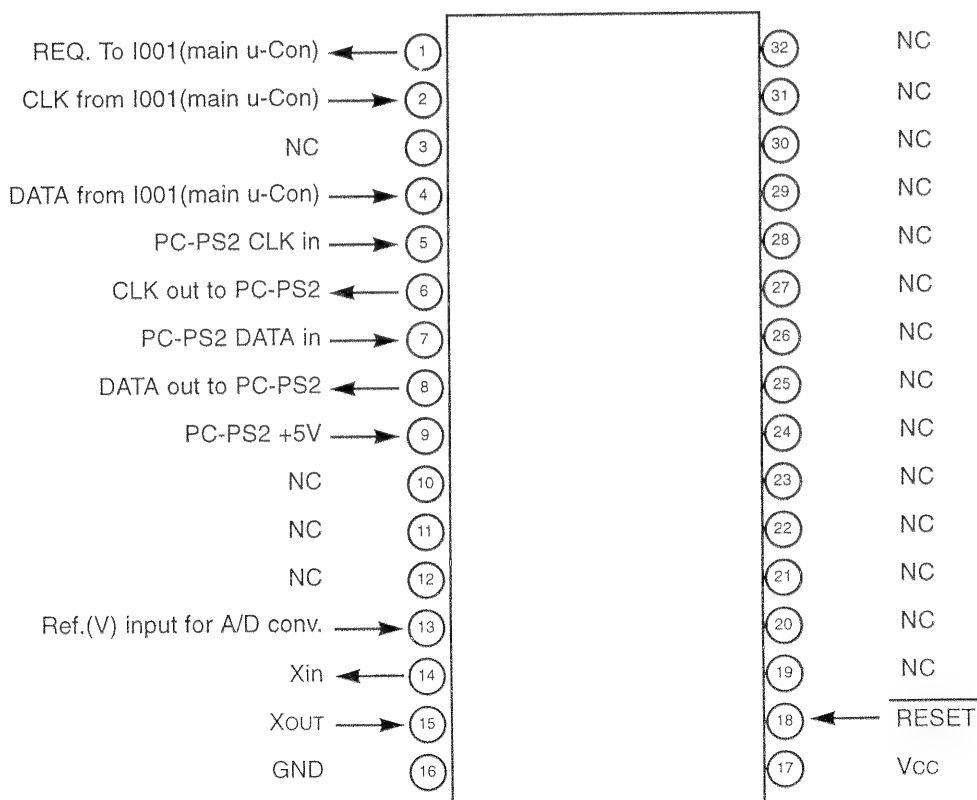
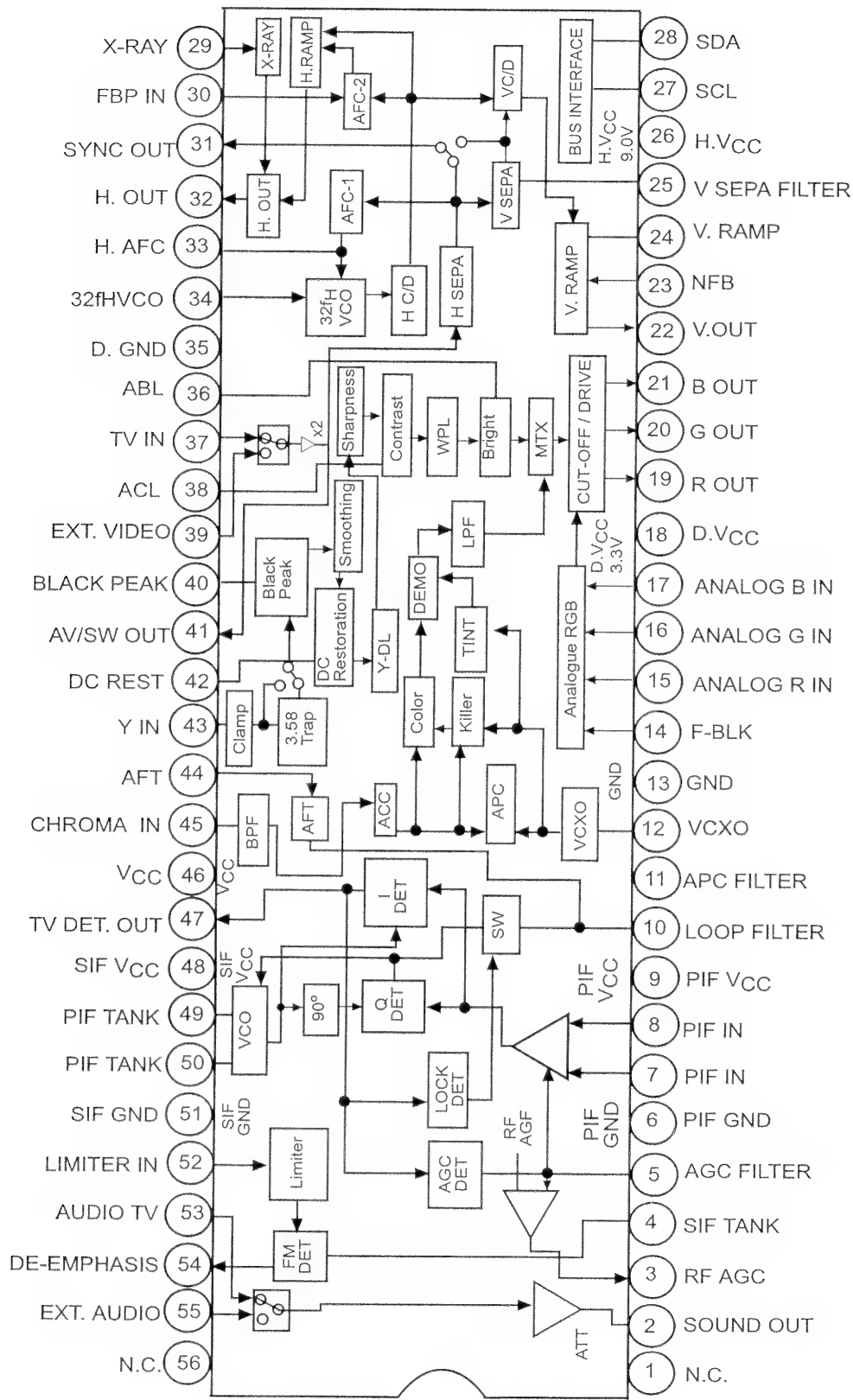


Fig. 5.2 IY02 PIN ARRANGEMENT.

6. VIDEO/CHROMA I201 (TA1268N) Pin Description



6.1 Terminal Function TA1268N-2

Pin no.-3 RF AGC

This terminal is for RF AGC output to the tuner.

Pin no.-4 SIF Tank Coil

This terminal is for connecting SIF detect tank coil.

Pin no.-5 AGC Filter

This terminal is for PIF 2nd AGC filter.

Pin no.-6 PIF GND

This terminal is for GND of PIF Circuit.

Pin no.-7, 8 PIF Input

This terminal is for IF input. The typical input value is 90dBuV.

Pin no.-9 PIFVCC

This terminal is for VCC (9V) of PIF circuit.

Pin no.-10 Loop Filter

This terminal is for PIF PLL loop filter.

Pin no.-11 APC Filter

This terminal is for APC Filter.

Pin no.-12 VCXO

This terminal is for 3.58MHz x'tal.

Pin no.-13 GND

This terminal is for Video/Chroma GND.

Pin no.-14 OSD Blanking

This terminal is input for OSD blk.

Pin no.-15, 16, 17 OSD RGB input

These terminals are for OSD RGB signal input.

Pin no.-18 Digital VCC

This terminal is for VCC (9V) for digital circuit.

Pin no.- 19, 20, 21 RGB Output

These terminals are for RGB primary color signal output.

Pin no.-23, 24 NFB, Vertical Ramp

These terminals are for NFB input and vertical ramp output.

Pin no.-25 Vertical Sync.

This terminal is for vertical sync. separation filter.

Pin no.-26 H.VCC

This terminals is for H.VCC (12V) of horizontal circuit.

Pin no.-27, 28 SCL, SDA

These terminals are for input and output of I²C Bus.

Pin no.-29 X-RAY

This terminal is for input of X-RAY protect circuit. The threshold voltage is 3.5V (Typ.) If this voltage is >3.5V, the H.OUT is pulled to low.

Pin no.-30

Fly-back Pulse Input (FBP)

This terminal is for Fly-Back Pulse input. For reference to H-AFC circuit.

Pin no.-32 Horizontal Output

This terminal is for horizontal pulse output.

Pin no.-33 H.AFC.

This terminal is for horizontal AFC filter. The AFC circuit control the horizontal phase by counting down 32f_H.

Pin no.-34 32fHVCO

This terminal is for connection of a 32FH (503kHz) ceramic oscillator.

Pin no.-35 D.GND

This terminal is for GND of digital circuit.

Pin no.-36 A.B.L.

This terminal is for A.B.L input.

Pin no.-37 TV Input / V IN

This terminal is the input for the Y-signal. From comb filter.

Pin no.-38 A.C.L.

This terminal is for ABL input for the ACL circuit.

Pin no.-39 External Video Input

This terminal is the input for the Y(s) signal.

Pin no.-40 Black Peak Detection

This terminal is for the filter for black peak detector.

Pin no.-41 Video Switch Output

This terminal is for video to I001 CCD

Pin no.-43 Y input

This is for Y signal input. The typical input amplitude is 1.0V.p.p

Pin no.-44 A.F.T.

This terminal is for AFC output to I001.

Pin no.-45 Chroma Input

This terminal is for chrominance signal input.
The typical input signal amplitude is 286mVp.p. (at burst signal).

Pin no.-46 V/C/D VCC

This terminal is for VCC (9V) of video, Chroma and deflection circuit.

Pin no.-47 TV Detection

This terminal is the output of the PIF detected signal.

Pin no.-48 S.I.F. VCC

This terminal is for VCC (9V) of SIF circuit.

Pin no.-49, 50 AFC

These terminals are for connecting a tank coil of PIF detector circuit.

Pin no.-51 S.I.F. GND

This terminal is for GND of SIF circuit.

Pin no.-52 SIF Input

This terminal is for input from the SIF limiter amplifier circuit.

Pin no.-54 De-emphasis

This terminal is for filter of SIF de-emphasis.

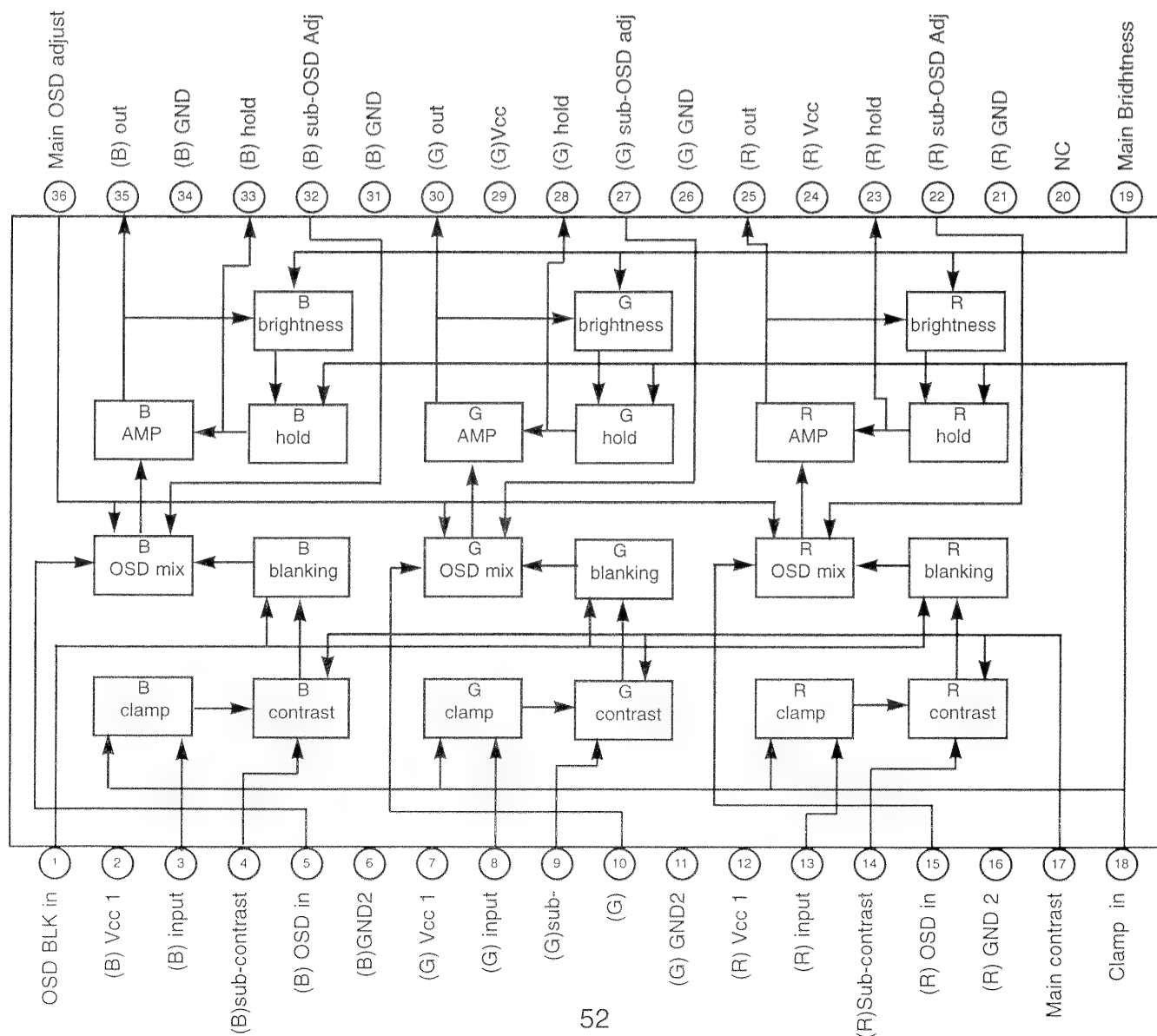
7. PC VGA SIGNAL PROCESSING

The RGB signals input from the VGA jack(JPC), are 75 ohm terminated and goes to the Sound PWB where it passes through high frequency filters XT11, XT12, and XT13. The RGB signals are input to I551. I551 has three individual circuits for RGB processing. The RGB signals are mixed with the PC OSD from I001. Clamping is done by the clamp output DC voltage of IN01. ABL and PBLK are added to the contrast control input pin 17 to blank the picture during retrace periods and to limit the beam current by varying the DC voltage at this pin. The contrast and brightness is set by I004 using I²C adjustment. I004 also set the V. centering, cut-off, and outputs the control for switching I381 chroma out. and a sync. detect control for detecting the sync. polarity.

The RGB signals are amplified and output at from I551 pins 25, 30 and 35 respectively to the I552 RGB switch, where it is switched between the TV RGB and input to the Video output circuit.

See Fig. 7 for the internal structure of I551, and fig. 7.1 for I004 structure.

Fig. 7: I551 (62320SP) structure



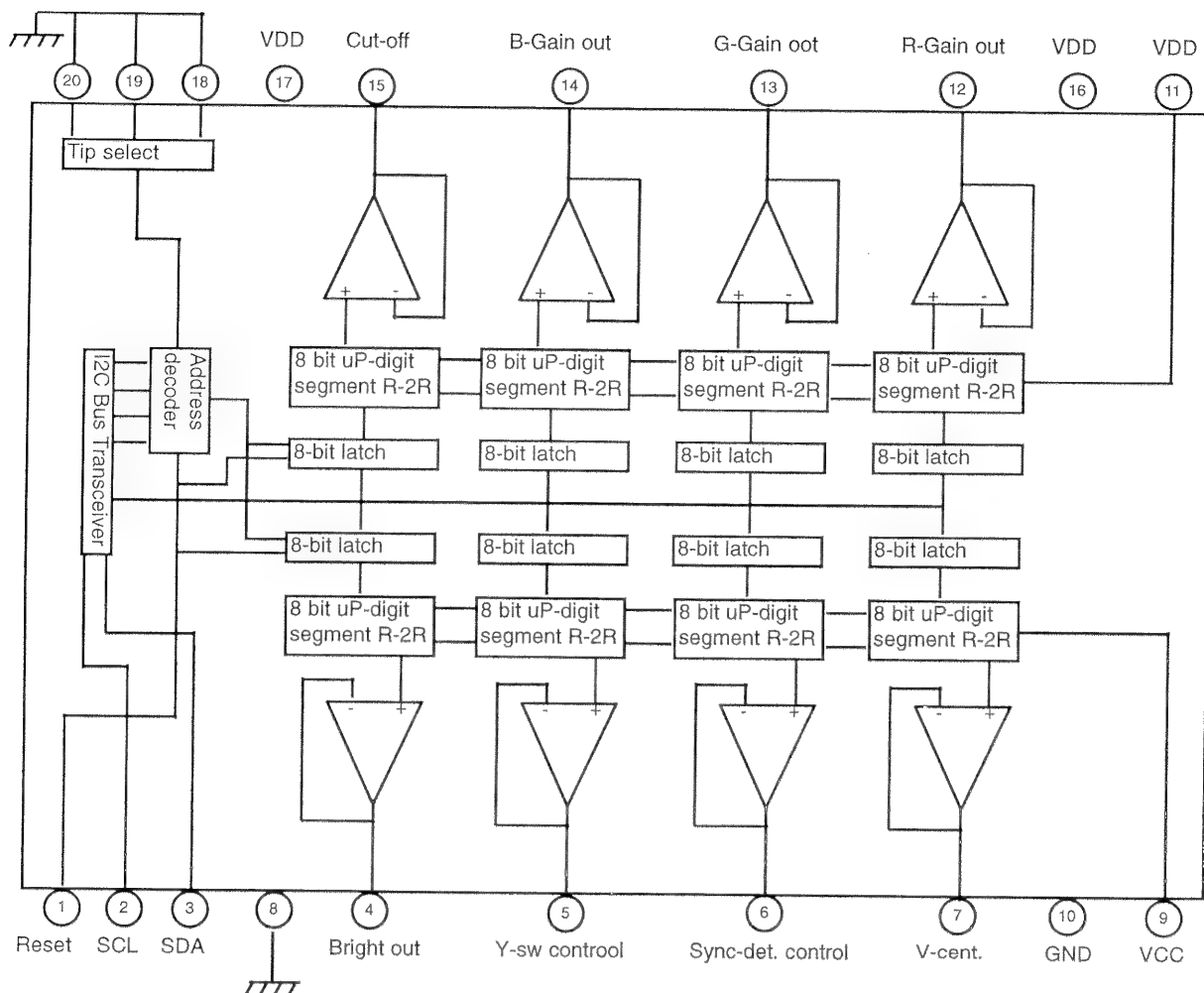


Fig. 7.1: I004 (M62393P) structure

8. PC SYNC. SIGNALS PROCESSING.

PC-H/V sync. signals is passed through emitter follower and clamp circuit composed of QN05, QN06, QN07, and QN08 to IN01(Sync. processor). This IC provides the following outputs:

1. Clamping or I551 RGB hold circuits.
2. H/V state signal to I001 to detect sync. or not.
3. H/V polarity to I001 to detect sync. polarity.

The V. sync(VD out) goes directly to IN71(sync. processor)pin 7, while the H.sync(HD out) is processed by IN40, and IN41, two Dual monostable multivibrators to set the H.phase, then sent to IN71 pin 10.

The V.osc. frequency is adjusted to 55KHz by RN7A to set the pull-in range for 60 and 70 Hz signals and is output as the V.Drive at pin 6. In TV mode QN74 is cut-off to stop V.drive. In PC mode, when 70 Hz is selected, QN73 conducts so RN77 is paralalled with RN7A and RN7C, to change the V.osc ferquency to 70Hz.

The H.sync is compared to the H.BLK(FBP) and the result signal is output at pin 12 to the AFC LPF and applied back to pin 13. The H.osc frequency is then adjusted to 31.5KHz by RN87 and output at pin 15 as the H.Drive.

See Fig. 8. and 8.1 for the internal structure of IN01, and IN71.

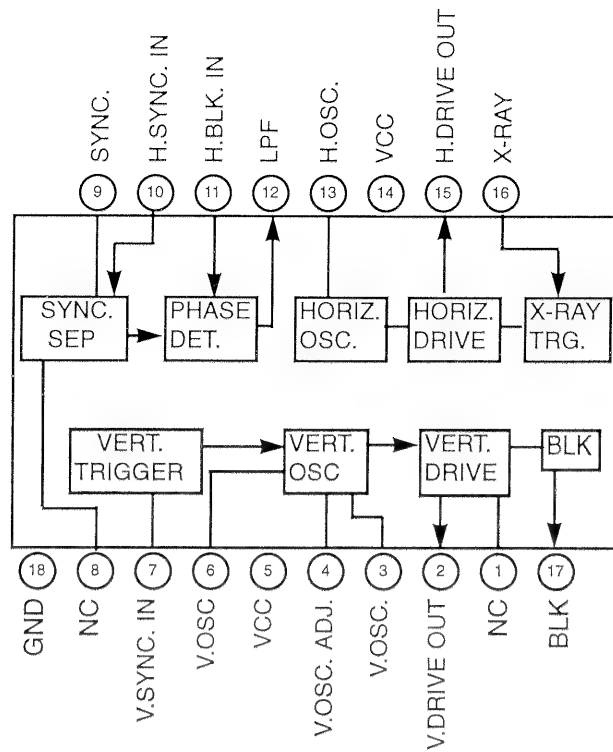


Fig. 8 IN71 (HA11423) STRUCTURE

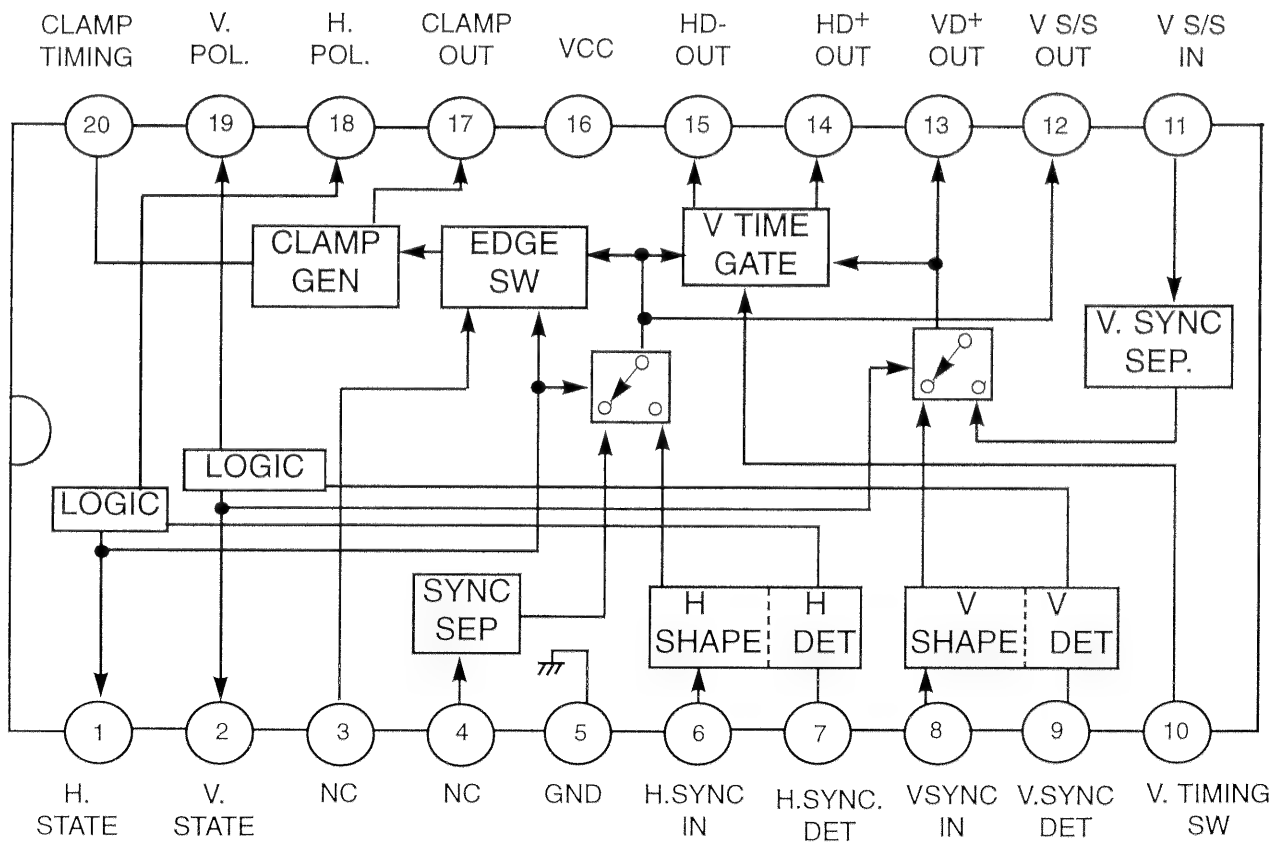


Fig. 8.1 IN01(52347SP) STRUCTURE

9. VERTICAL AND HORIZ. DISTORTION CORRECTION. (See Fig. 9.)

The vert. drive signal output from IN6A(Sync. switch) is input to I602 pin #13-(TA8859CP- Distortion correction IC) on the side pin PWB. I602 shapes the vert. sawtooth to a parabola waveform and it is output at pin #2 to I621 pin #3 (NJM2903-Dual OP-AMP) . The FBP(flyback pulse) is also applied to I621 pin#2. This OP-AMP modulates the FBP with the parabola and is output from pin#1 to The H.size /Side Pin drivers Q603, and Q604 to the H. Size PWB.

VERTICAL POSITION ADJUSTMENT.

The vertical position circuit is composed of QVC1, QVC3, and QVC4. The V.cent. output(V) from I004 pin#7 varies the base of QVC1, which changes the DC bias being added to the VDY by QVC3 and QVC4 through RVC5 and RVC6 to change the Vertical position of the picture.

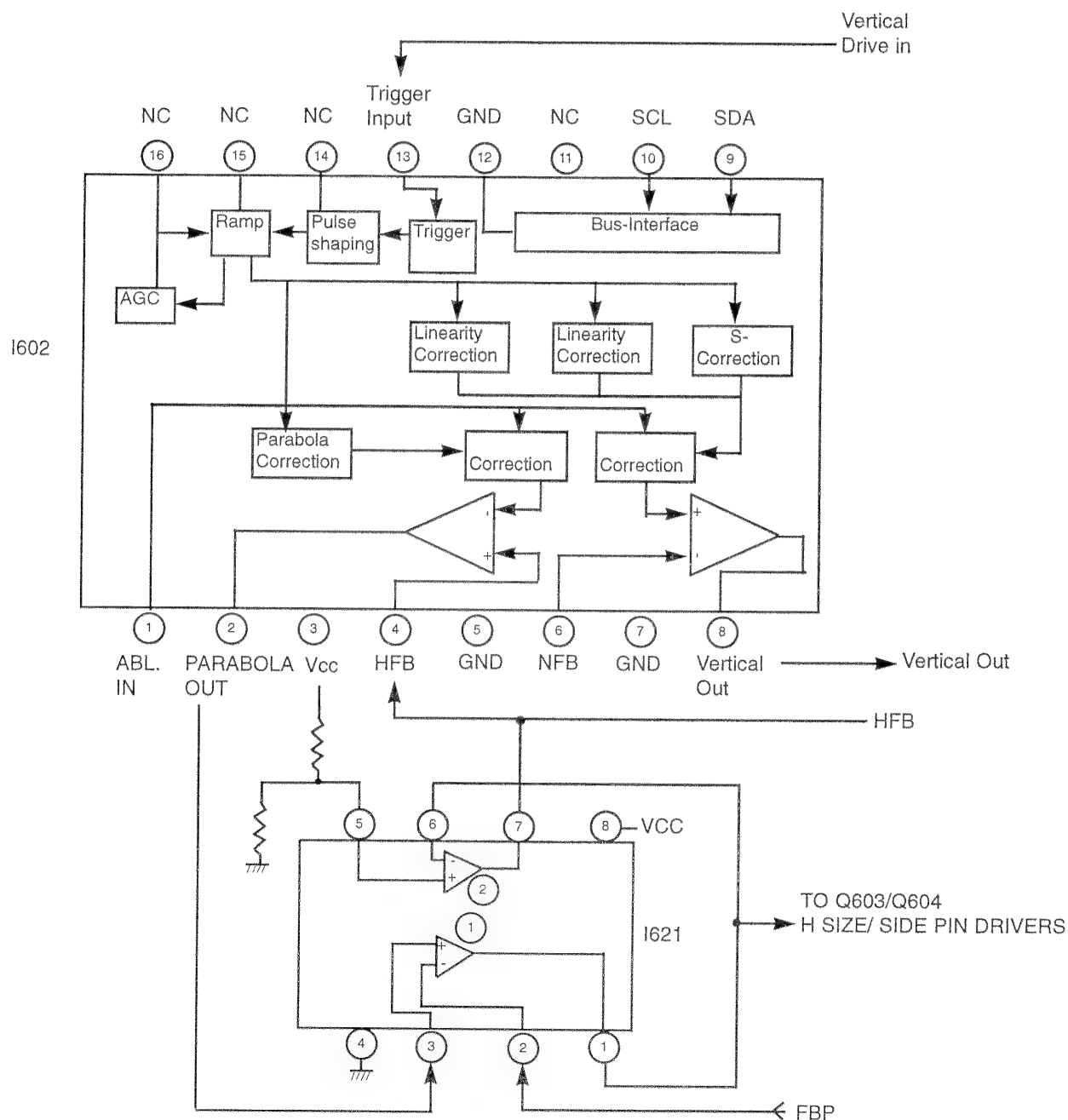


Fig. 9.1: VERTICAL/HORI. DISTORTION CORRECTION

10. HORIZONTAL OUTPUT OPERATION

The Horiz. output, Q702 and the damper D712/D714 perform switching operation to supply the HDY deflection current. When Q702 conducts, the current in the HDY coil increases linear until Q702 is cut-off. The energy stored in the DY decreases, charging the resonance capacitors C713, C71G, C716, and C71M. These capacitors then discharge across the DY coil in a reverse direction. D712 and D714 conduct to suppress this reverse voltage. When the damper current becomes zero, Q702 conducts again.

Fig. 10 and 10.1 shows the components which are switched in TV mode and PC mode by relays S701, S702, and S703.

In TV mode, S701 and S702 is closed, and S703 is open, L704 adds inductance, along with L702, L703, C741, C742, C743, C745 R741, R742, AND R743 to control linearity, and H.size, by adjusting Horiz. pulse width and High voltage.

In PC mode, S701, and S702 is open, and S703 is closed. When S703 is closed, it puts a short across L704, L703, C741, C742, C743, R741, R742 cancelling this circuit. Linearity and H.size is then set by L702, R743, C745. Q756 is made to conduct, adding C71H, and C714 for "S" correction.

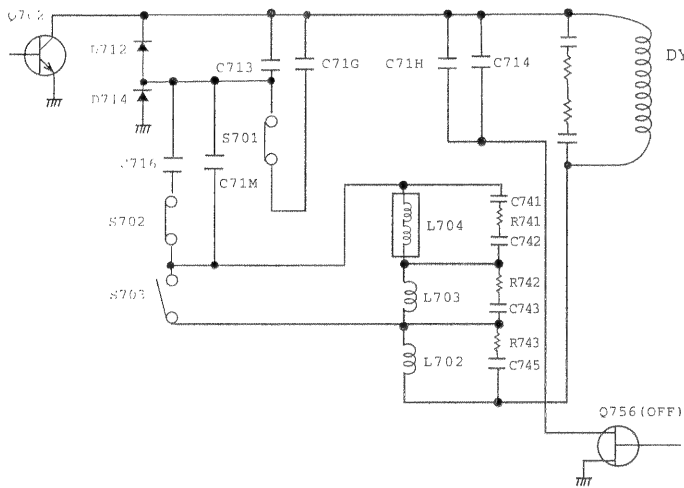


Fig.10: H.OUT CIRCUIT IN TV MODE

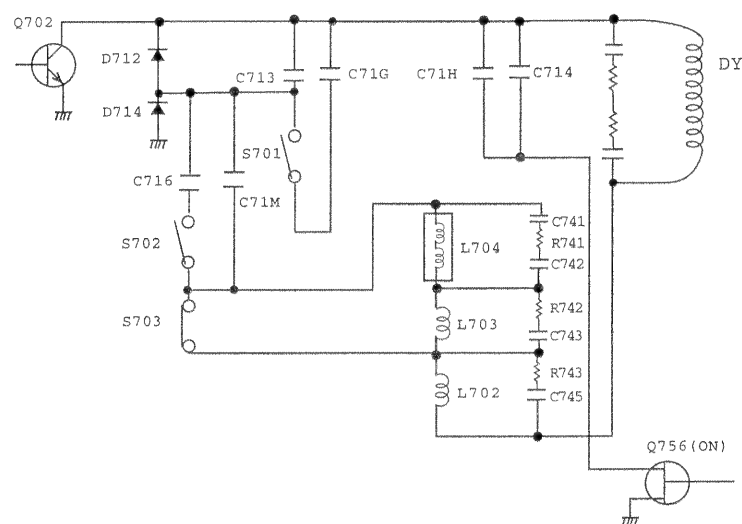


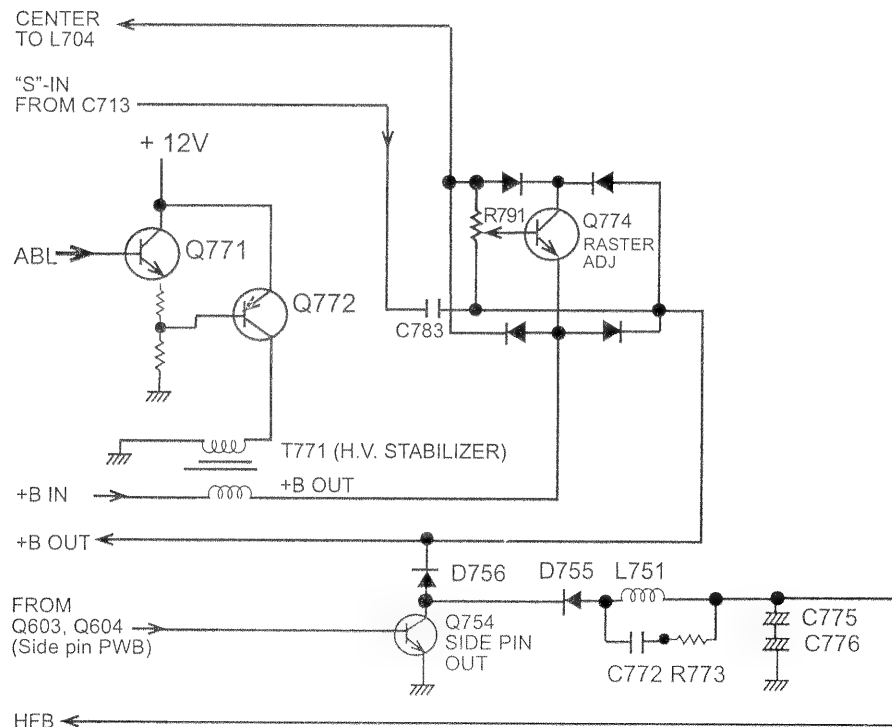
Fig.10.1: H.OUT CIRCUIT IN PC MODE

(see Fig.11)

If the picture becomes dark, the ABL voltage increases. Q771 and Q772(B) voltage increases and the current in T771 primary winding drops, increasing the inductance of the secondary winding to bring down the +B and the HV.

2. Raster centering circuit: This adjustment is used in PC mode only. In TV mode, Q751 is switched by I001 (TV/PC 4B) to conduct providing a return path for the LED of I751. The photocoupler of I751 also conduct to stop Q774 operation.

3. Side Pin Output: The output of the side pin drivers Q603,Q604 goes to (B)Q754. Q754(Side pin output) output is a parabola (HFB) modulated by the H and V cycles and applied to the point at C713 and D714 to control the Side pin and the H.size.

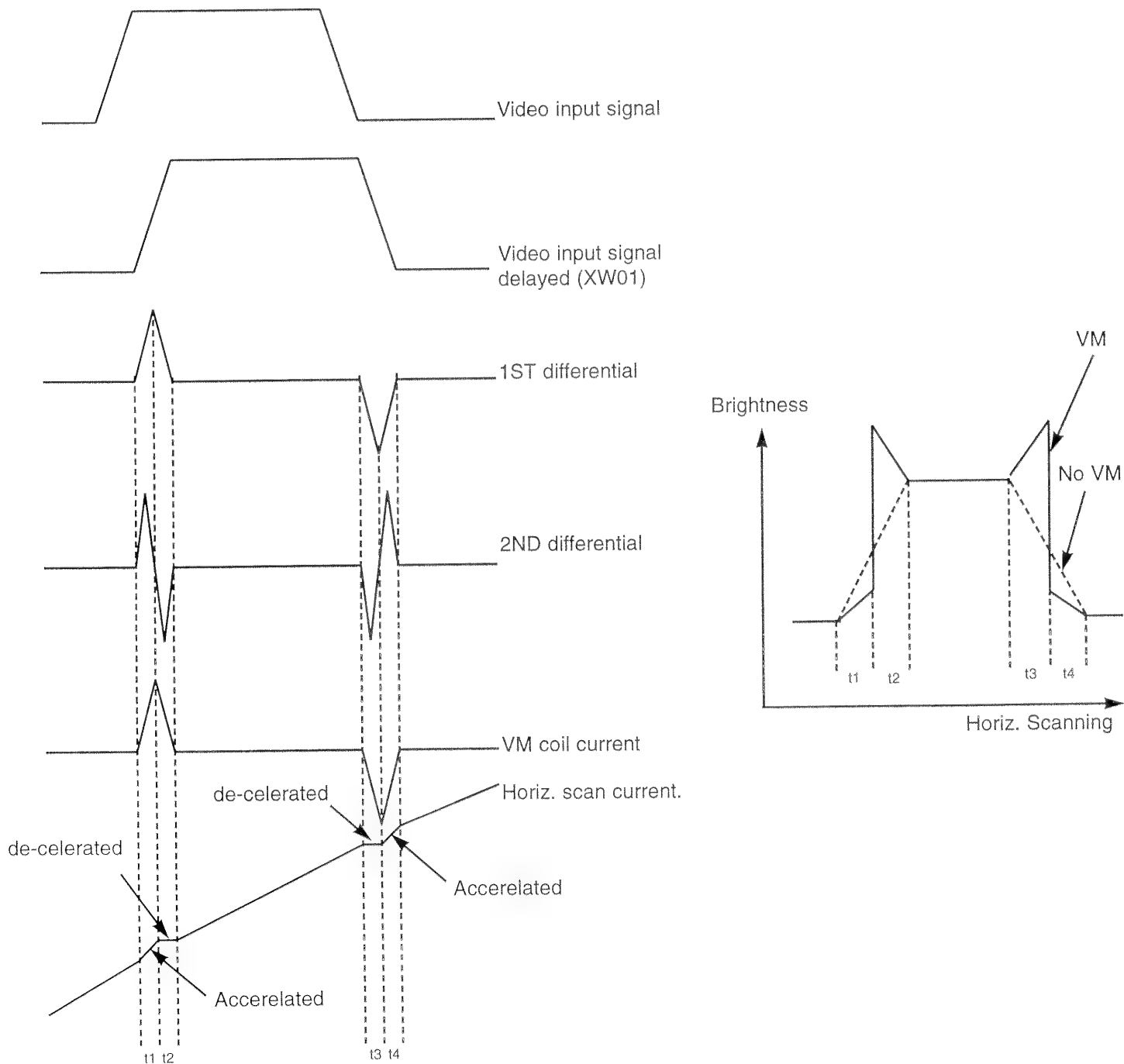


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12. VM CIRCUIT OPERATION

The VM circuit improves the definition between black and white edges by accelerating or decelerating the horiz. scanning speed of the electron beams. As a result, the gradient of the ramp of the leading edge of the luminance signal is increased with the brightness changes and the video bandwidth of the video signal narrowed simultaneously to sharpen the edged.

The Y signal is differentiated by QW03, QW04, QW05, and QW06. The second differential of the Y signal is applied to QW13, VM amplifier, then to the VM drivers, QW07, and QW08. QW09 and QW10 are the VM output amplifiers which drive the VM coil. The current applied to the VM coil creates a magnetic field which varies the velocity of the horiz. scanning of the electron beam. QW12 and QW02 are Y buffer and amplifier. The Ys signal is applied to QW11 to cut-off the VM when OSD is displayed.



13: MTS Decoding

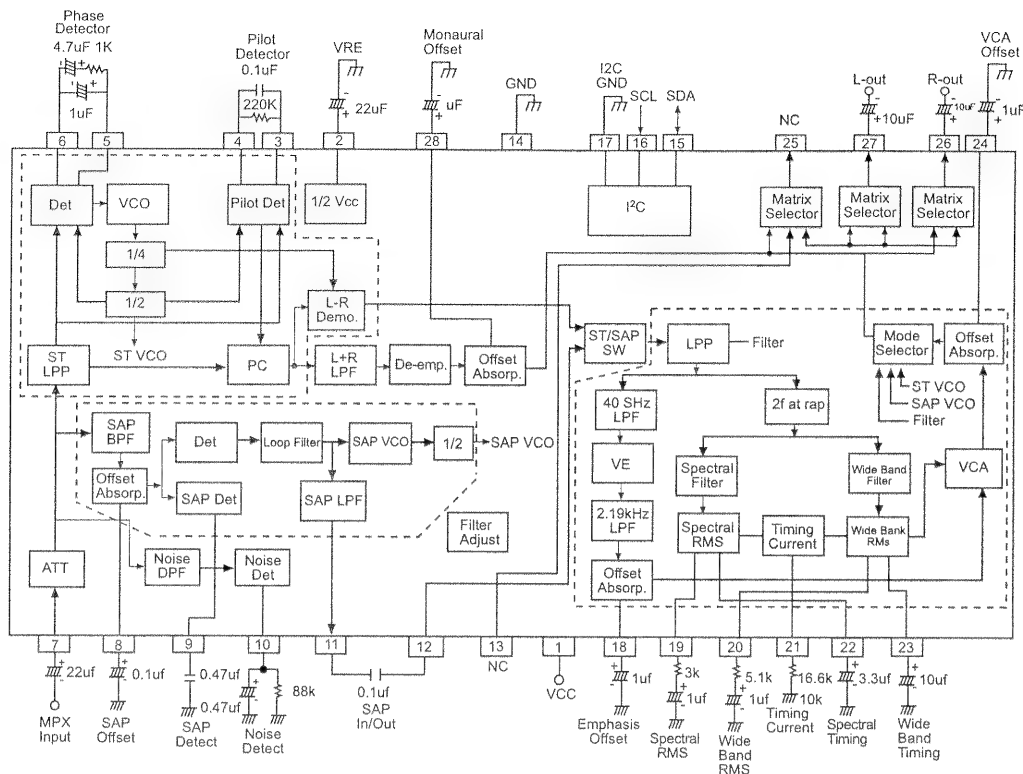


Fig. 13. I402 Structure (MPC 1854CT).

I401(uPC1854CT) MTS DECODER OPERATION

1. Stereo Demodulation

The ST-LPF is used to remove the SAP(5fH) and telemetry(6.5fH). The resulting signal is sent to the phase detector. The phase detector converts it to a DC voltage and is filtered by C445, C446 and R448. The 8fH VCO is divided and produces two fH signal, one in phase with the pilot signal and the other 90 degree out of phase.

The signal from the ST-LPF is also sent to the Pilot Detector which converts it to a DC voltage and is stabilized by R459 and C447 which is used to determine the ON/OFF condition of the Stereo indicator. The Pilot Cancel cancels the pilot signal by adding the stereo signal with matrix signal at the response level of the input pilot signal. The pilot signal is also sent to the L-R demod. which demodulate the AM-DSB component of the L-R signal and the L-R signal goes to the ST/SAP switch.

The L+R LPP consists of 2 traps tuned to fH and 24Khz to remove the L+R signal and passes through a 75us de-emphasis filter to the mode selector.

2. SAP Demodulation block.

The composite audio signal is also applied to The SAP BPF(peaked to 5fH) to remove the SAP signal. The output of the SAP BPF goes to the SAP DET. It is full wave rectified to a DC voltage and smoothed by the C443 on pin #9. When this DC voltage is reaches a certain level, SAP signal is detected.

The NOISE BPF extracts noise around 11.5fH, and full wave rectified to a DC voltage used to detect noise in weak signal condition to turn-off the SAP indicator. The gain and the time constant are determined R447 and C440.

The SAP demodulation circuit consists of a phase detector, loop filter, and SAP VCO. The Phase detector and the loop filter creates a PLL loop. The VCO 10fH is divided by 2 to obtain the SAP VCO. The SAP LPF eliminates the carrier, and SAP is coupled to the ST/SAP sw by C442.

14. AUDIO SIGNAL PROCESSING.

(See Figs. 14, 14.1, and 14.2)

The audio L and R signals from the MTS decoder IC I402, and the PC L and R signals from the PC input jacks along with the TV-AUX L and R audio are switched by I483(uPD4052C) on the IF/MTS PWB. The L-s and the R-s are the output signals which are sent to the Audio Vol/Tone control IC I SA1(M62420SP) on the Sound PWB.

ISA1 consists of three voltage controlled amplifiers per channel. These serves to control Volume, Tone(Bass/Treble) and Surround. It is I2C controlled, and internal switches are used to turn Surround ON or OFF. Tone frequency is set by the external capacitors CS03,CS04,CSA6, AND CSA7.

Audio L and R are output at pins#14, and 7 to preamps QA01,QA02,QA03,QA04 to provide external HIFI audio outputs. Muting is done by Q461 and Q462 for L and R output. The L and R signals are also sent to the Audio output IC I403 (LA4613) on the main PWB.

This IC consist of input amp., driver amp., and output amp. per channel. The audio signals are amplified and output at pins#3(L), and pin#1(R). Internal speakers are turned ON/OFF by Q411 controlled by the main uPC I001.

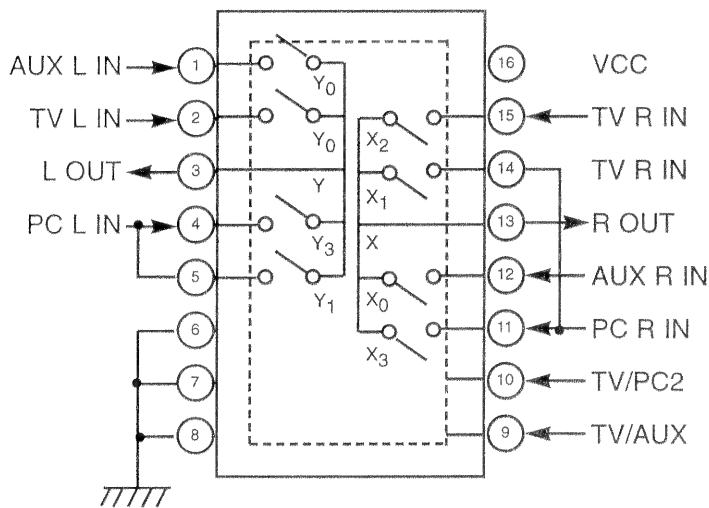


Fig. 13.
AUDIO SWITCHING I483 (uPD4052C)

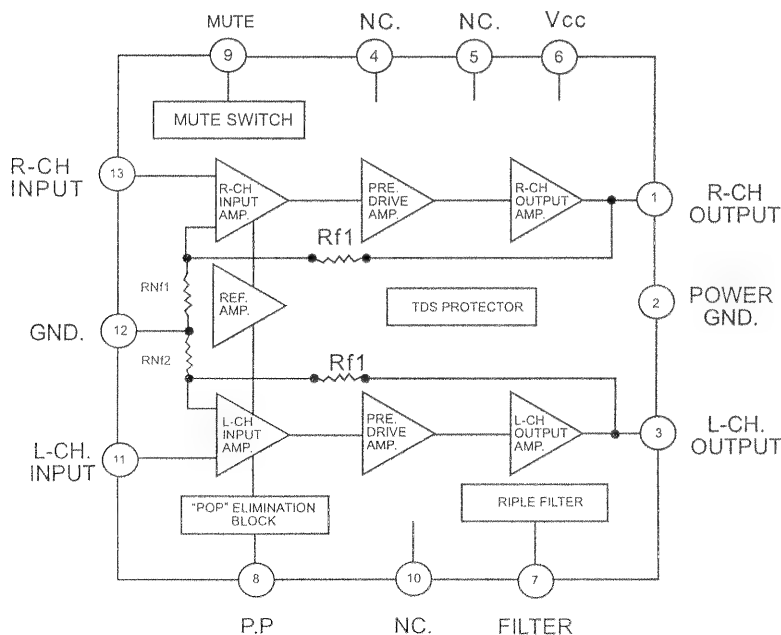


Fig. 13.1
AUDIO OUTPUT I403 LA4613)

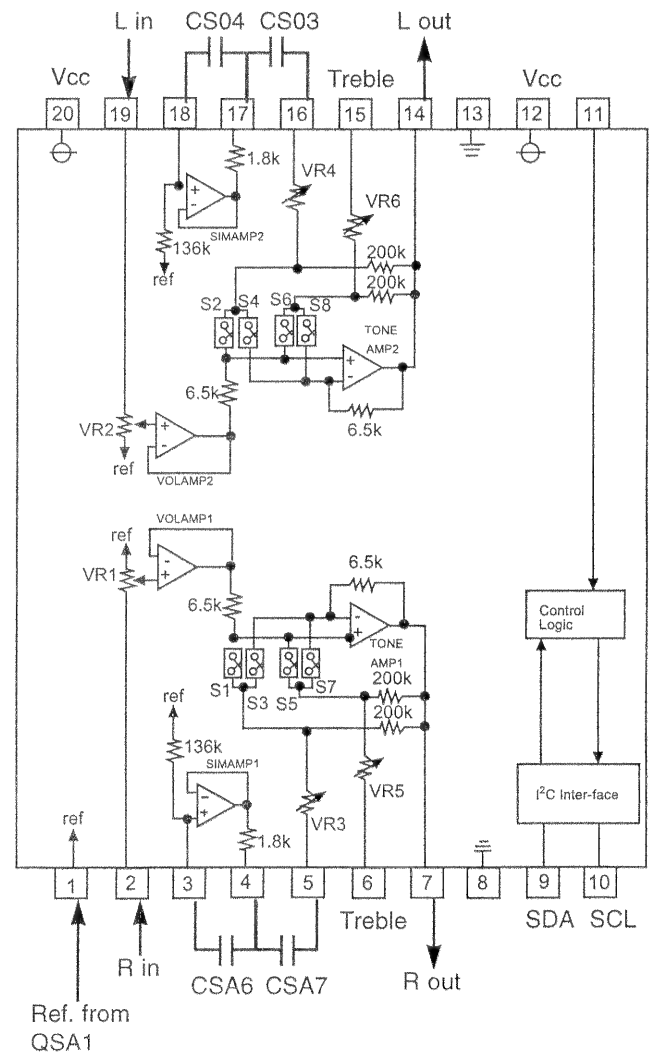


Fig. 13.2
AUDIO PRE-AMP. ISA1(M62420SP)

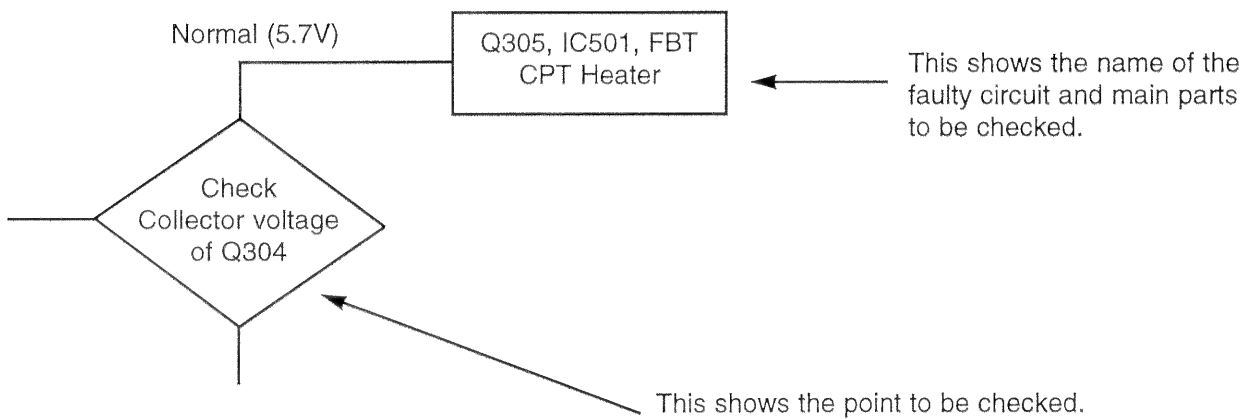
TROUBLESHOOTING

PRODUCT SAFETY NOTE

The shaded and ⚠ marked components have special characteristics important to safety. Read carefully the product safety notice of each service manual. Don't degrade the safety of the receiver through improper servicing when replacing any of this components.

HOW TO USE THE FLOW CHART

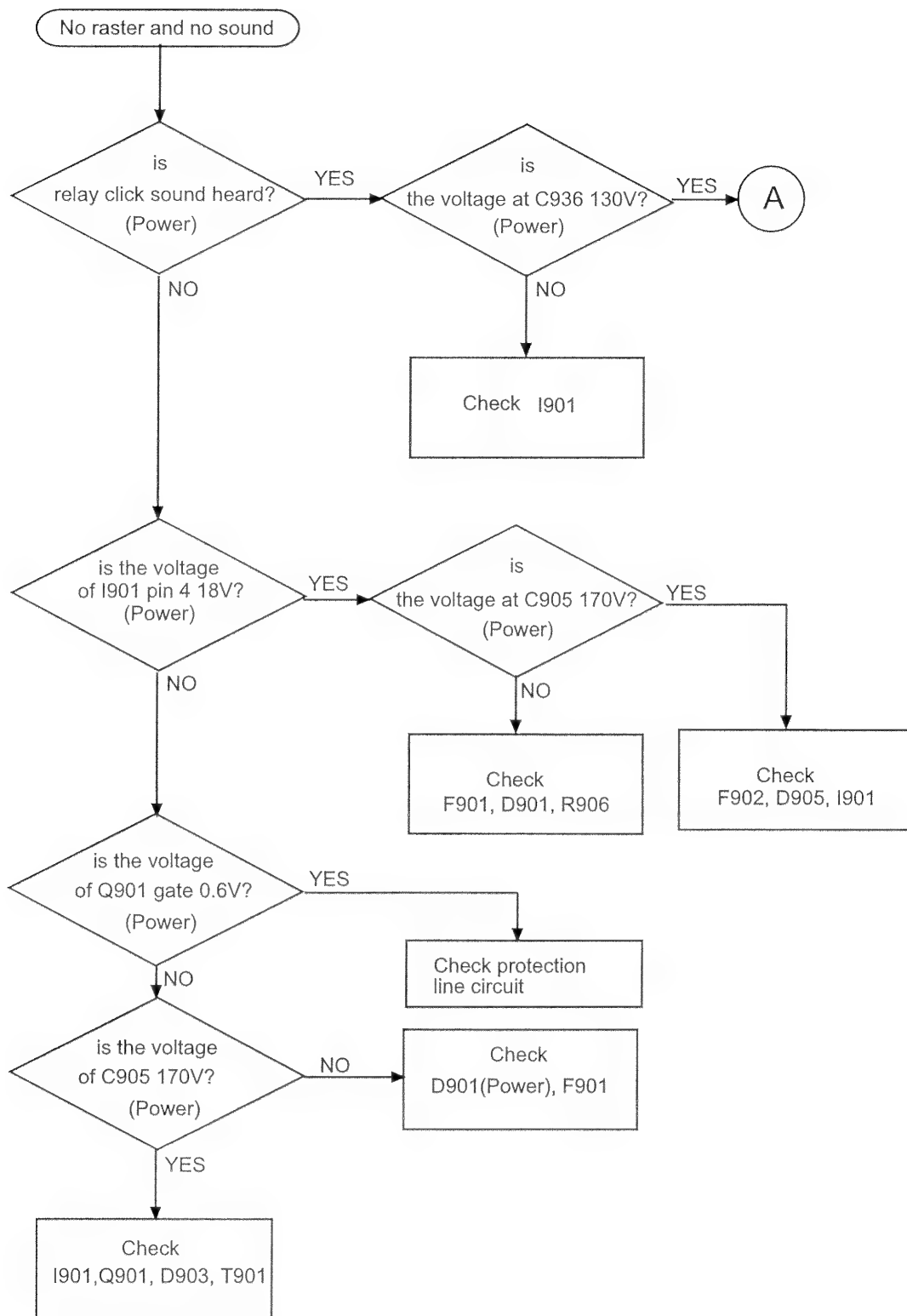
(1) The flow chart shows the following:

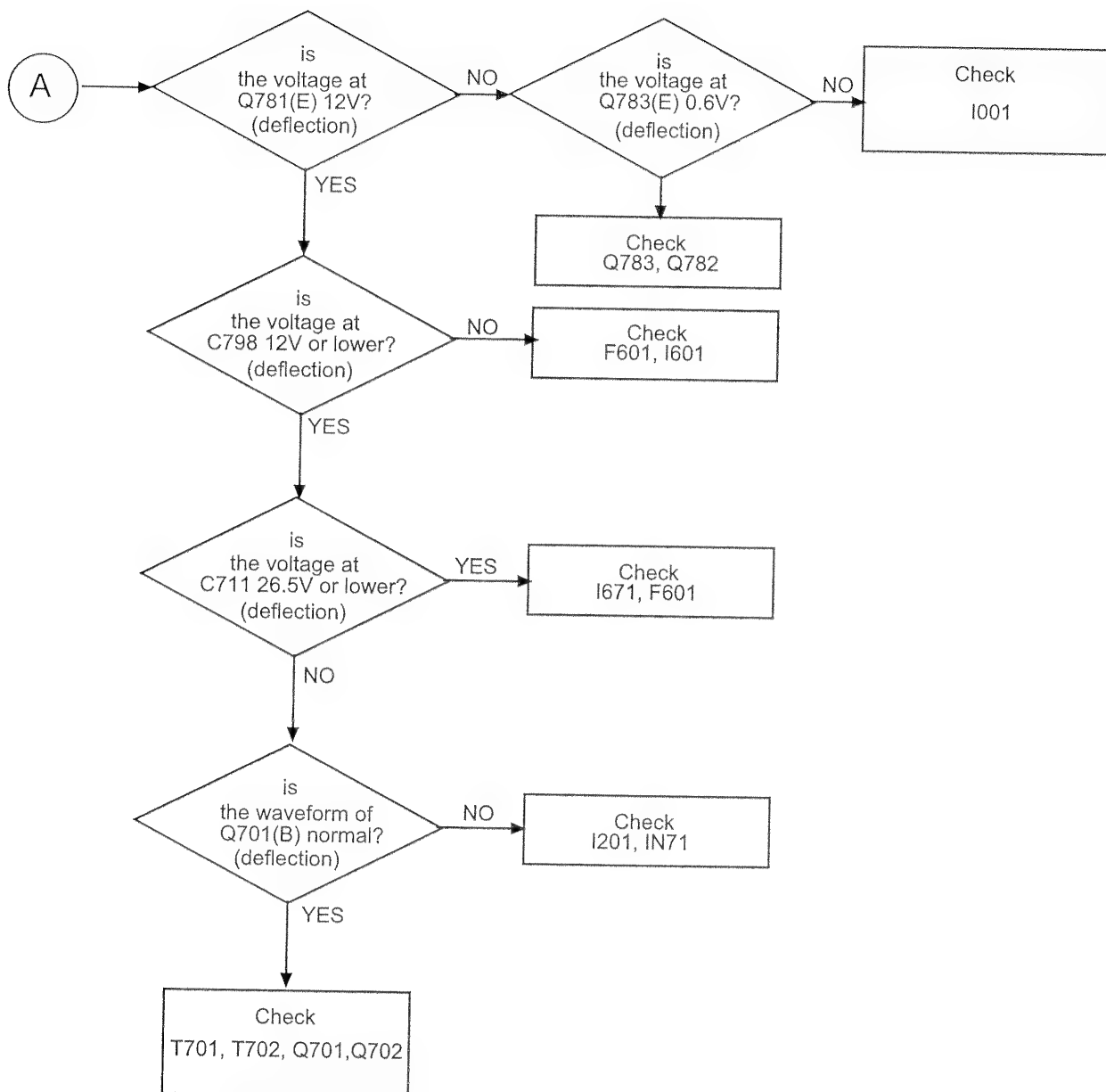


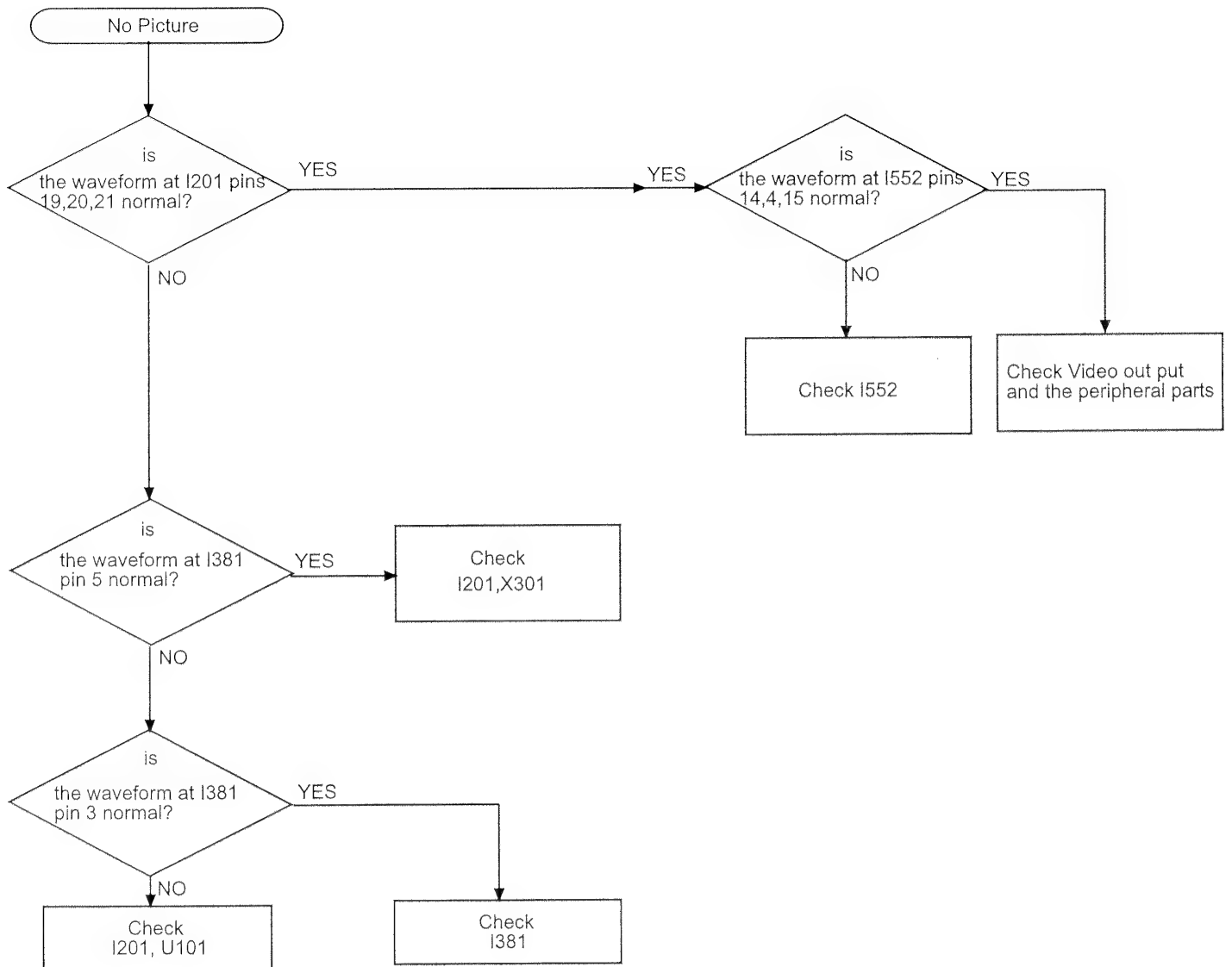
(2) The voltage shown in the chart may differ to some extent depending on the condition of the set and tester.

PRECAUTION ON MAKING MEASUREMENTS AND ON HANDLING

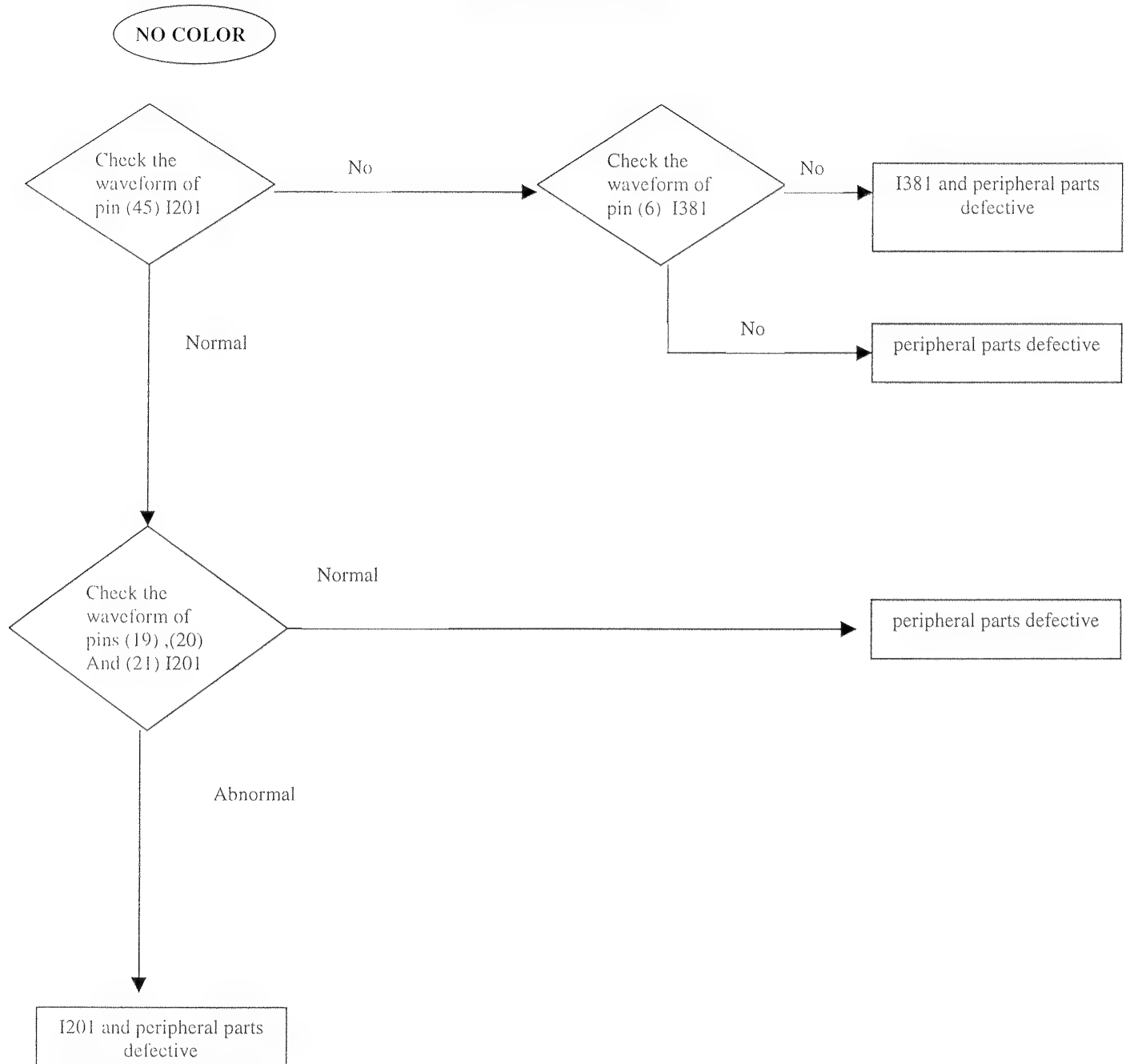
1. When any parts become abnormally hot or there is a smell of burning, cut off the power immediately.
2. Do not make shorts between circuits or across terminals except for those specified.
3. When measuring the voltages of ICs and TRs, be careful that the test lead of the tester does not touch any other terminal.
4. Measure the voltage correctly.
5. Measure the resistance over a small range.
6. Be sure to switch off the power when replacing parts.
7. Do not apply a soldering iron for a long time when replacing parts. (Use a solder-wick.)
8. Use an isolation transformer when troubleshooting.





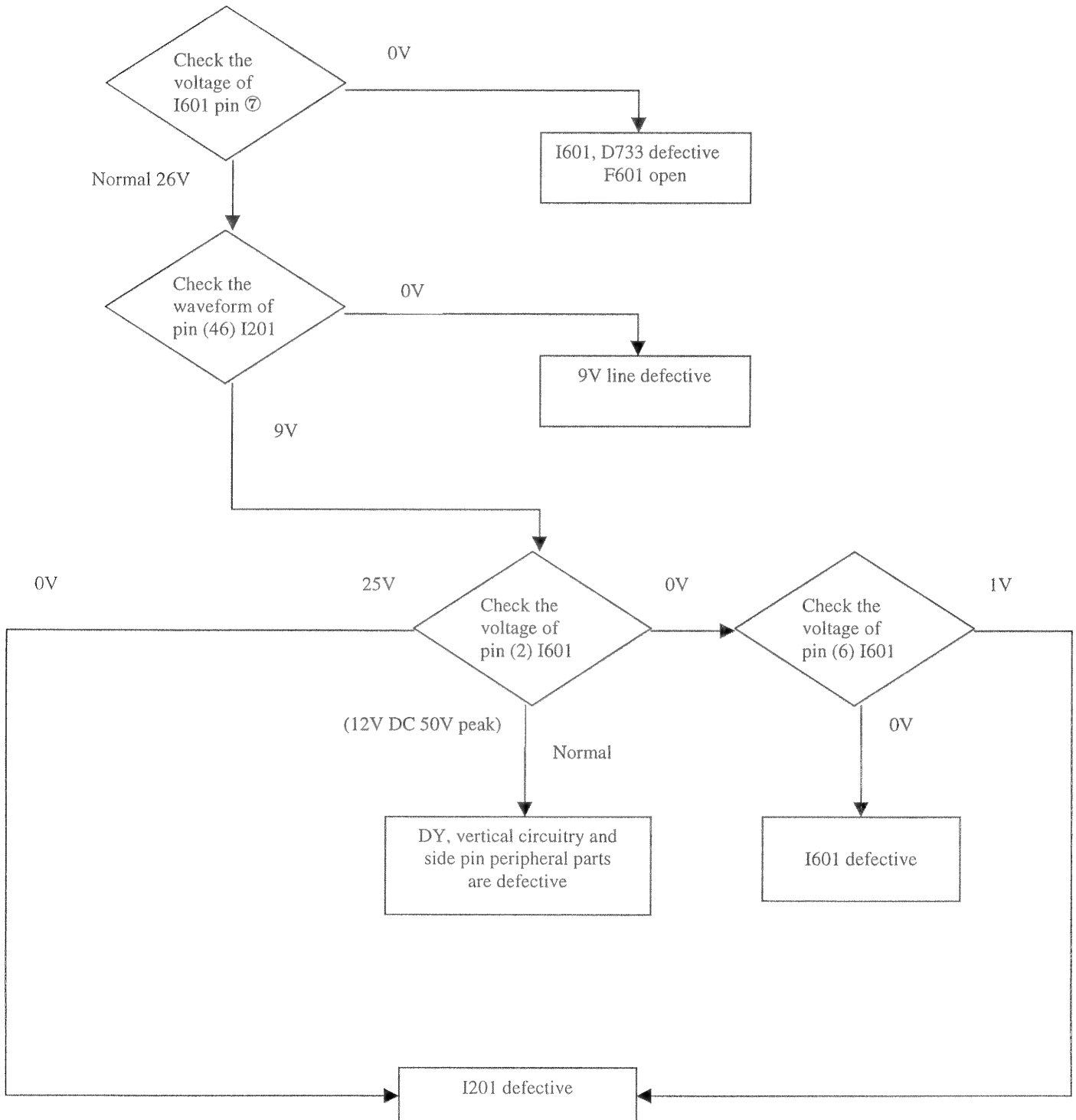


TROUBLESHOOTING

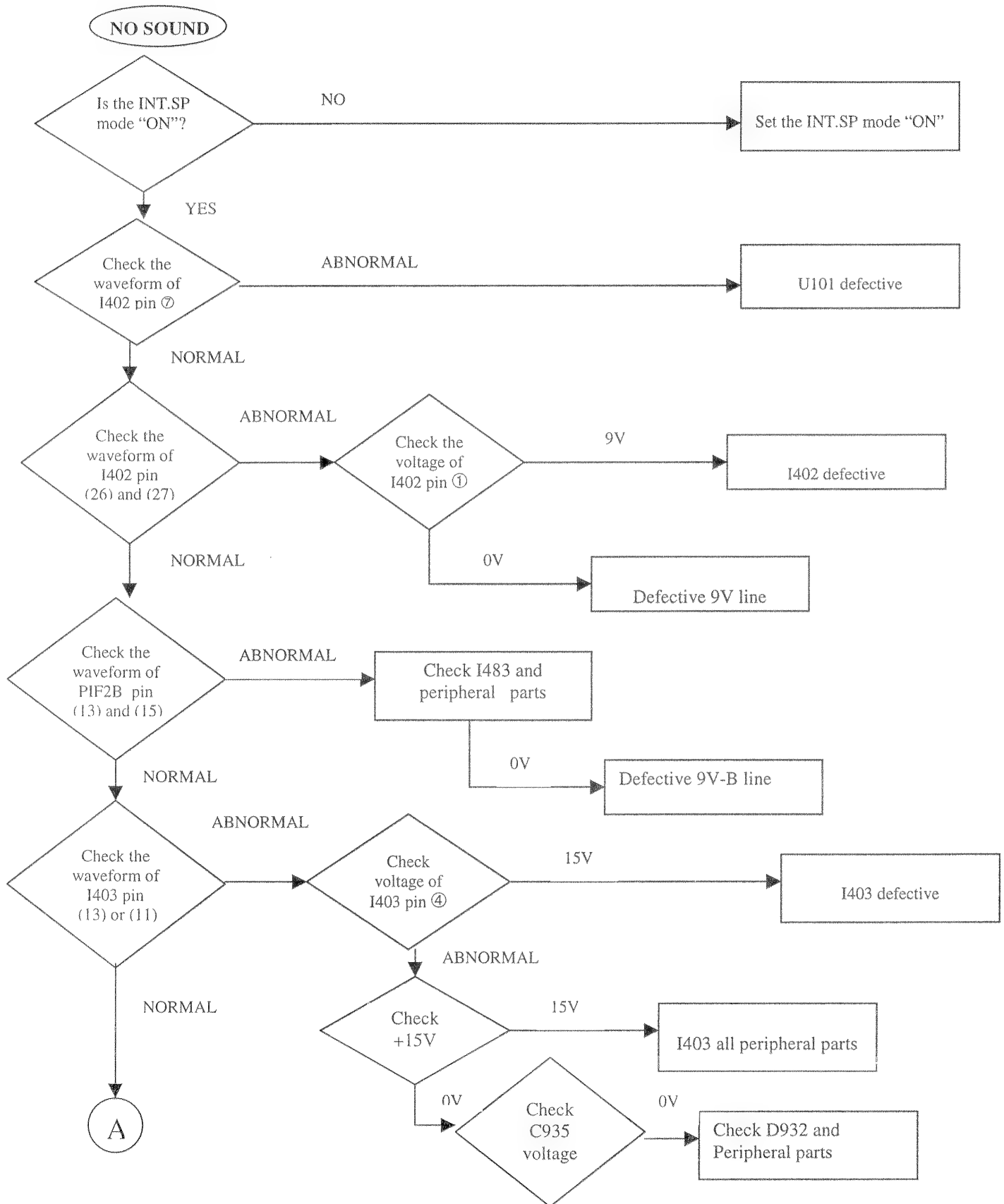


TROUBLESHOOTING

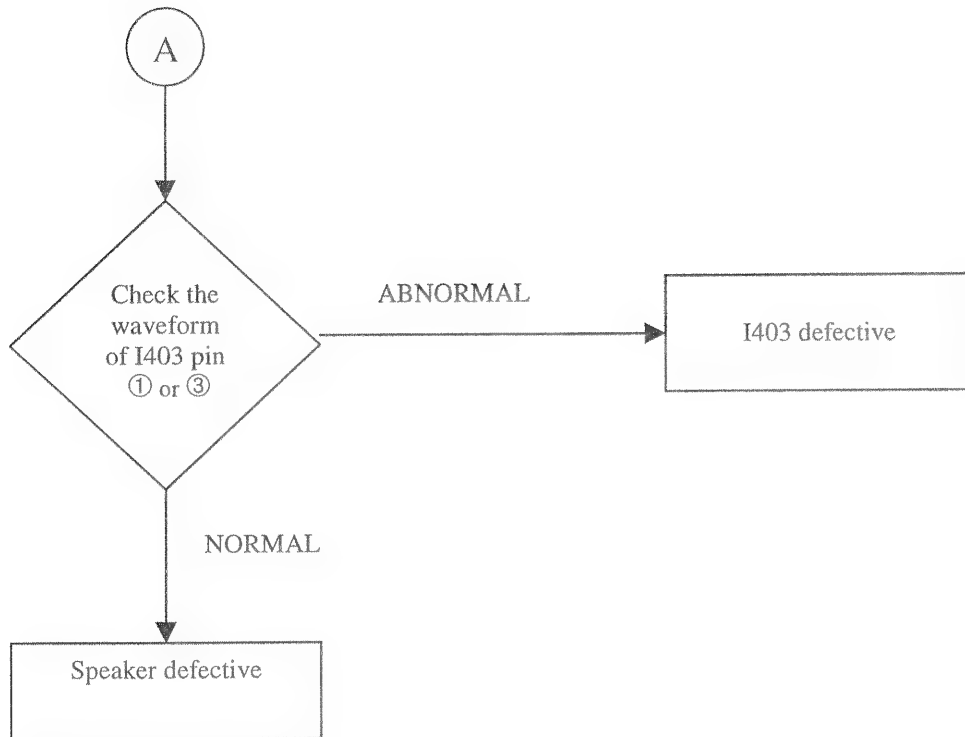
NO VERTICAL DEFLECTION OR V. SIZE IS DISTORTED



TROUBLESHOOTING

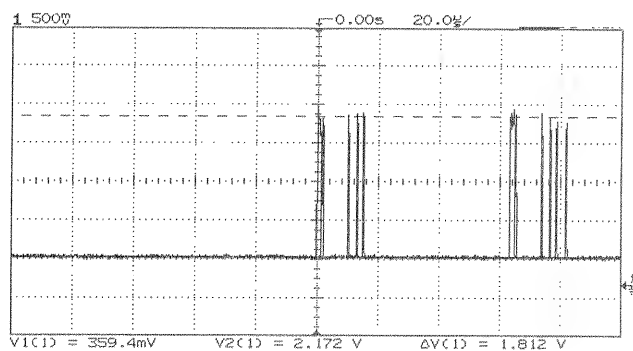


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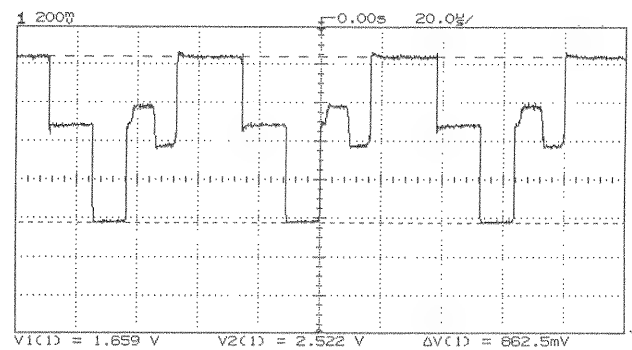


Waveforms

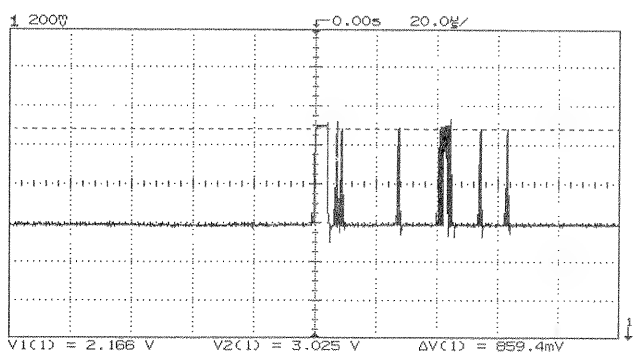
① PIF1B pin#7- OSD BLK



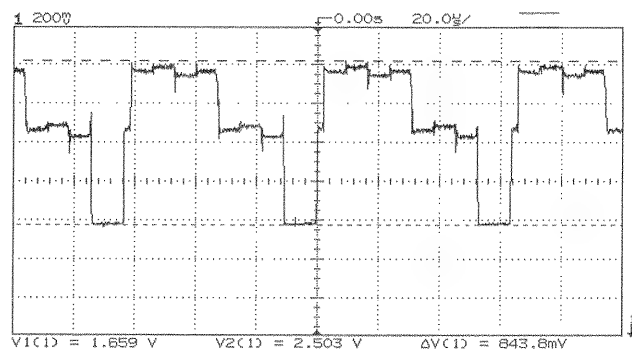
⑤ PIF1B pin#11- RED OUT



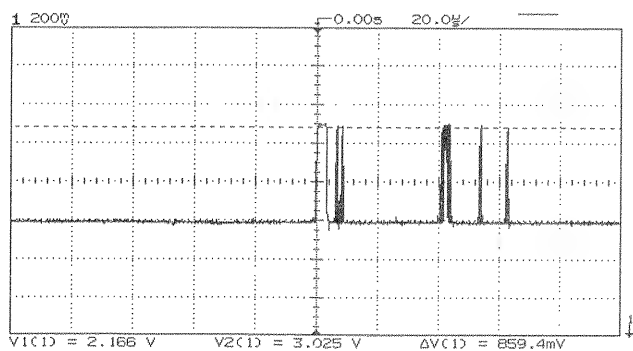
② PIF1B pin#8- OSD RED



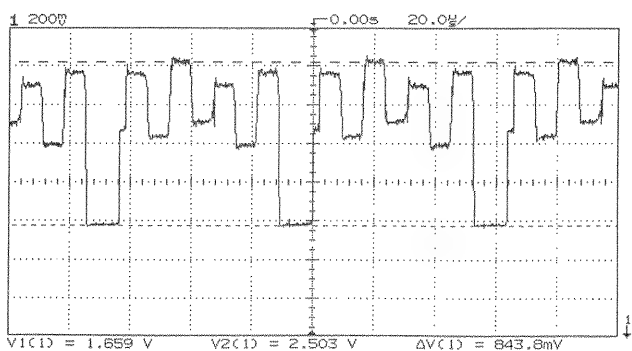
⑥ PIF1B pin#12- GREEN OUT



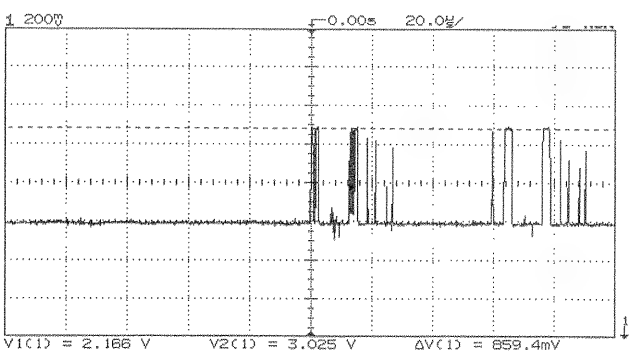
③ PIF1B pin#9- OSD GREEN



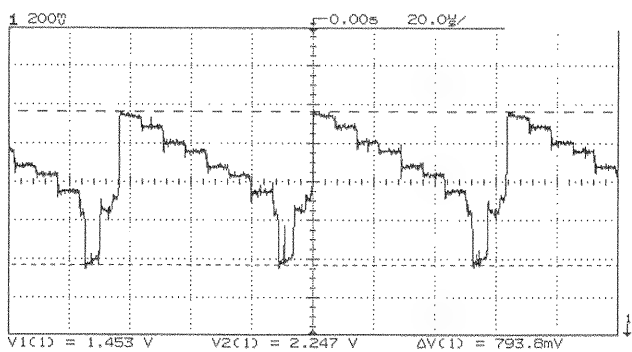
⑦ PIF1B pin#13- BLUE OUT



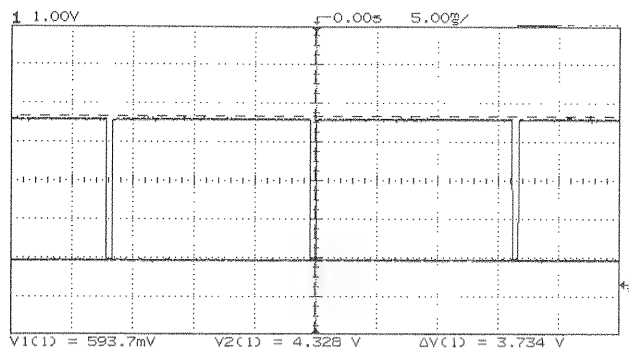
④ PIF1B pin#10- OSD BLUE



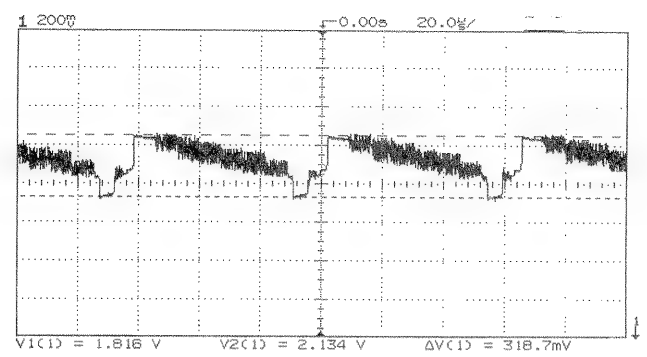
⑧ PIF2B pin#1-Y-IN(COMB)



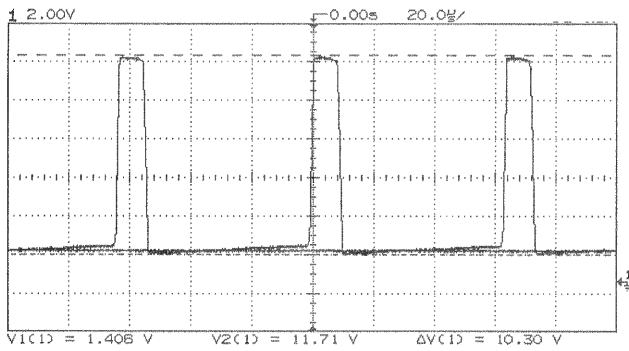
9 PIF1B pin#6- V.RAMP



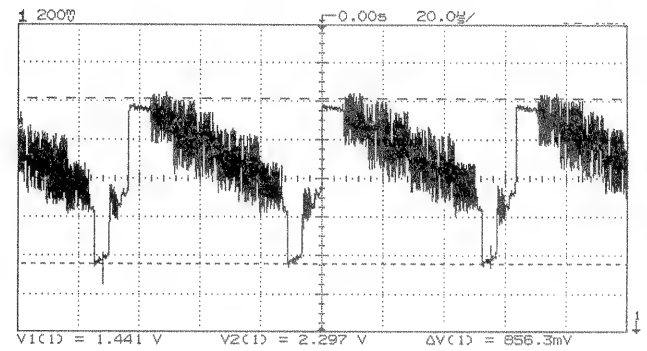
13 PIF2B pin# 3- CHROMA IN



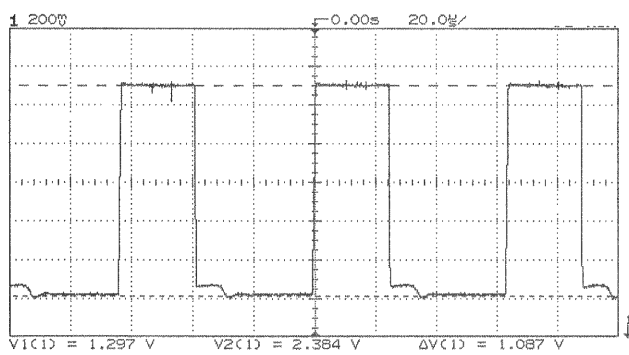
10 PIF3B pin#12- FBP



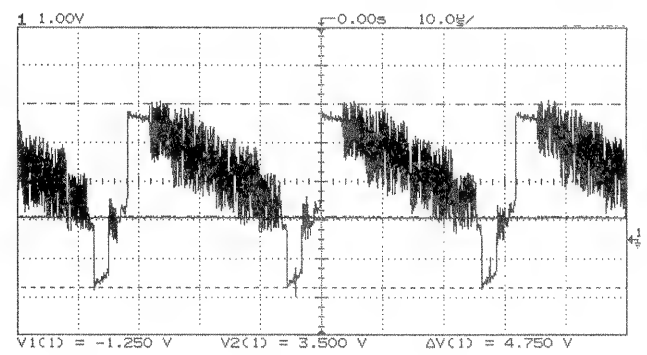
14 PIF2B pin# 5- TV VIDEO



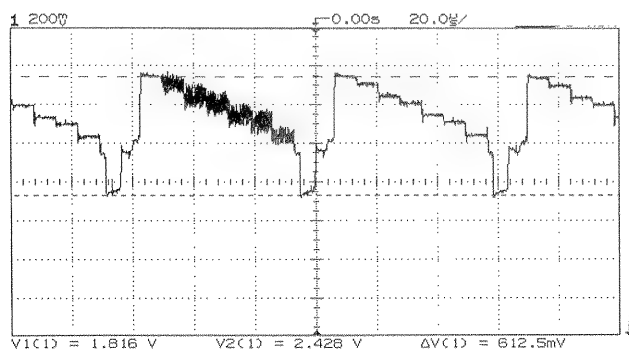
11 PIF3B pin#13- H. OUT



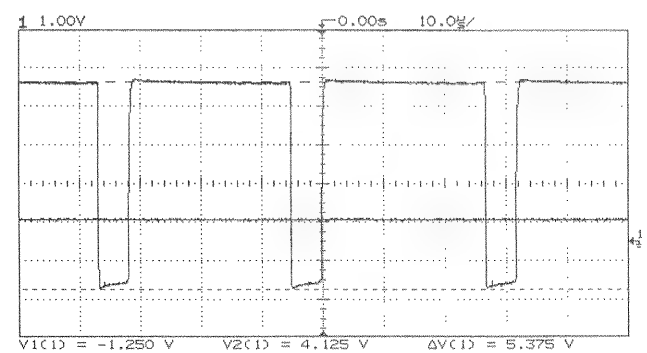
15 I381 pin#5-VIDEO OUT



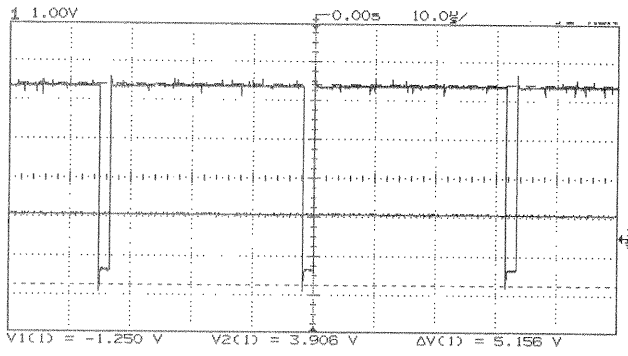
12 PIF3B pin#15- VIDEO-CCD



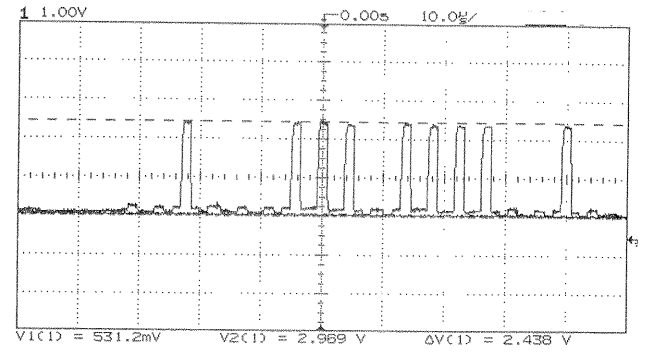
16 I001 pin# 1-H.SYNC.



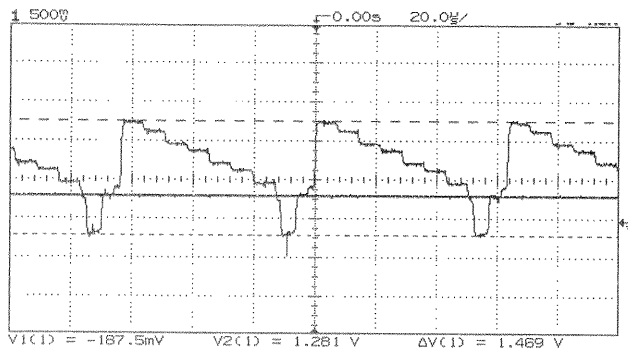
17) I001 pin#2-V.SYNC.



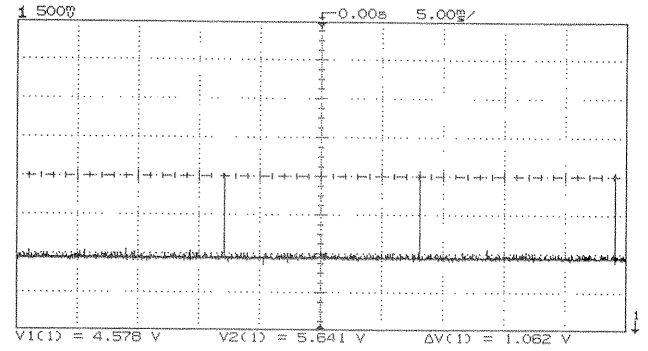
21) IN01 pin# 1-H-STATE(PC mode)



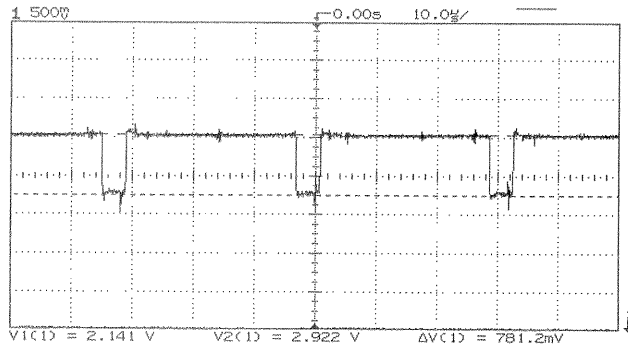
18) I001 pin#22-CCD-Vin



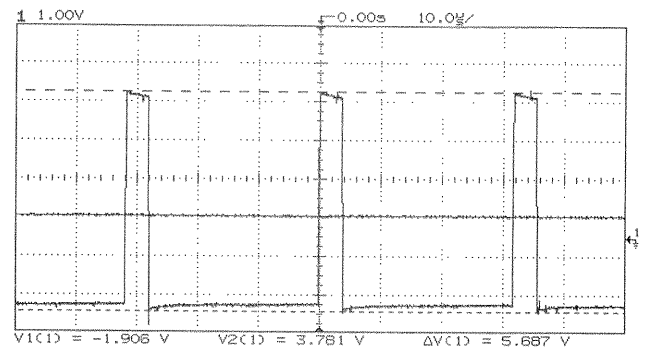
22) IN01 pin# 2-V-STATE(PC mode)



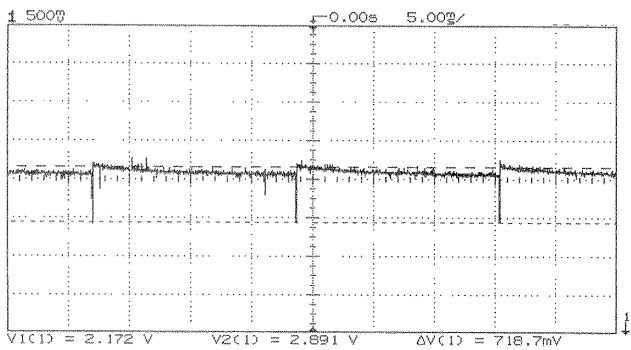
19) IN01 pin#6- PC-H (PC mode)



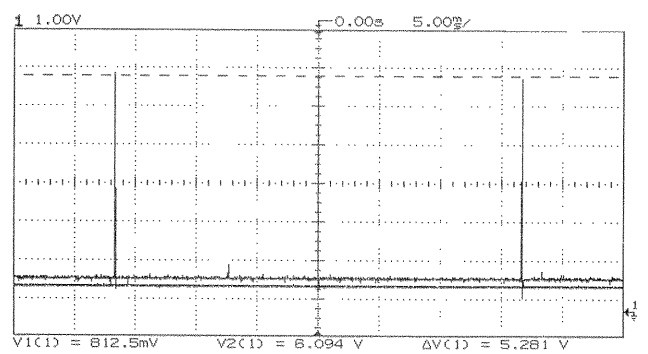
23) IN01 pin#14-HD-OUT(PC mode)



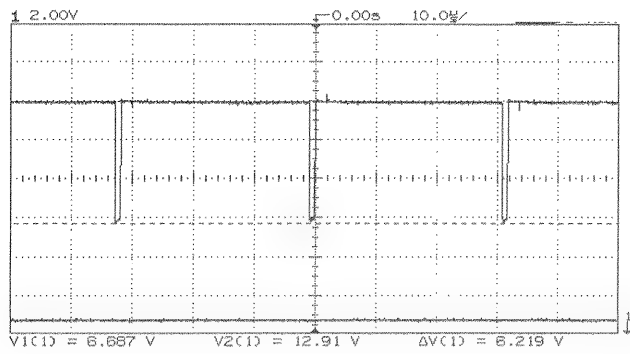
20) IN01 pin#8-PC-V (PC mode)



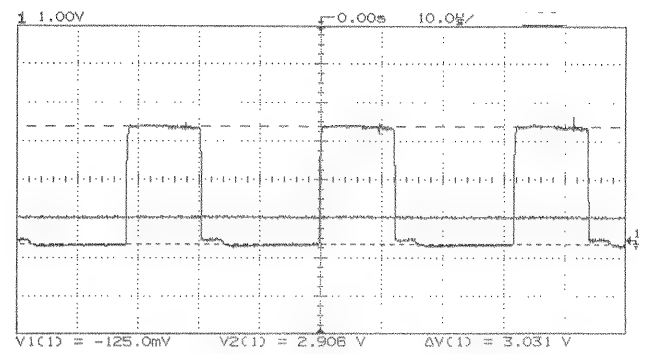
24) IN01 pin#13-VD-OUT(PC mode)



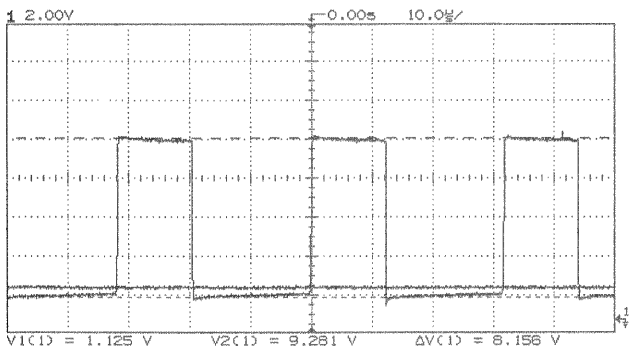
②5 IN71 pin# 10-H. SYNC. in(PC mode)



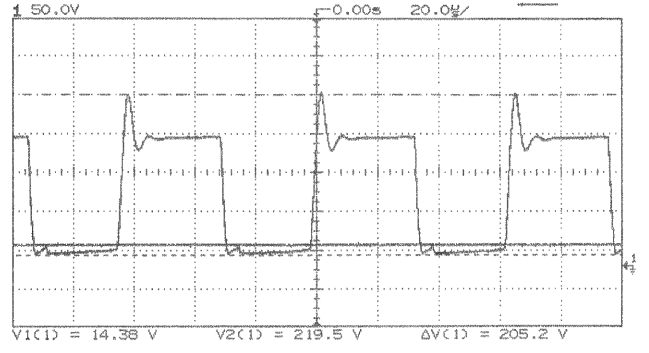
②9 IN6A pin # 14-H.DRIVE. (PC mode)



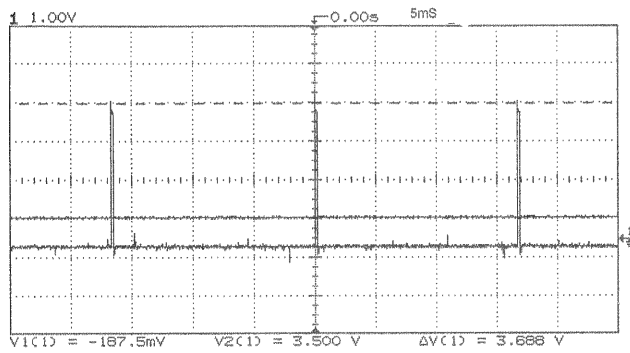
②6 IN71 pin # 15-H.SYNC. out(PC mode)



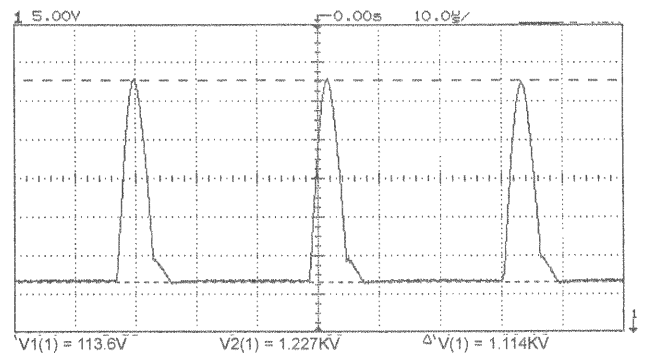
③0 Q701(C) H.DRIVE OUT



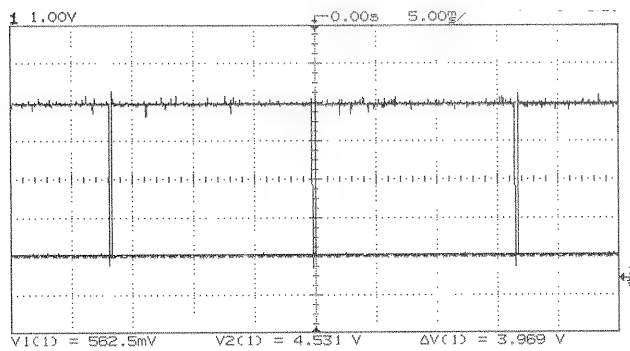
②7 IN71 pin # 6-V.SYNC. out(PC mode)



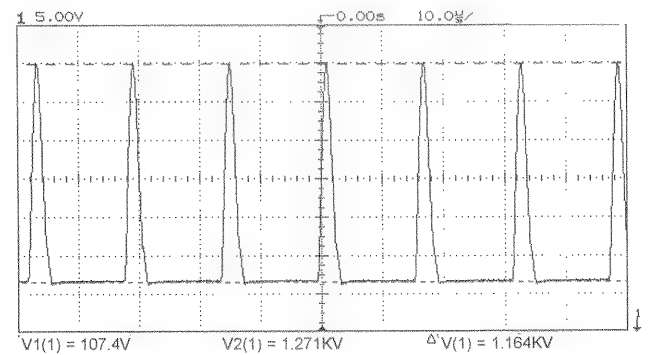
③1 Q702(C) H. OUT-TV



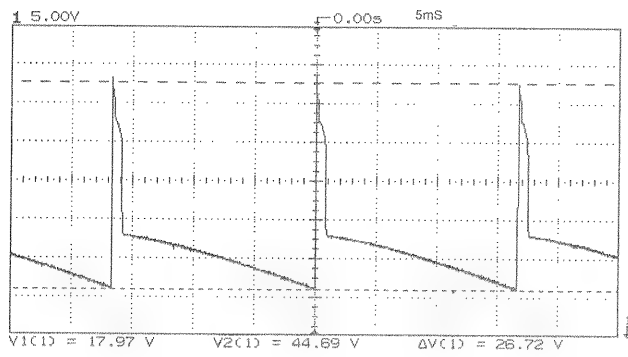
②8 IN6A pin # 4-V.DRIVE. (PC mode)



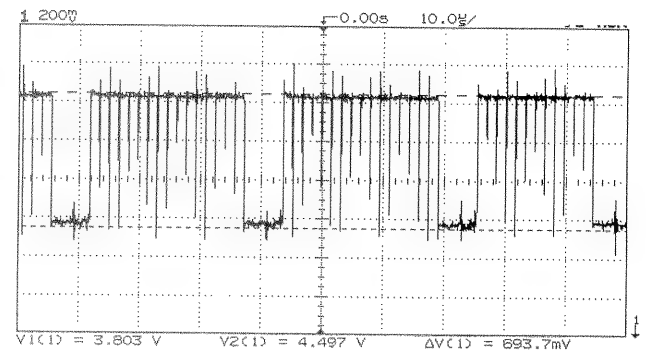
③2 Q702(C) H. OUT-PC



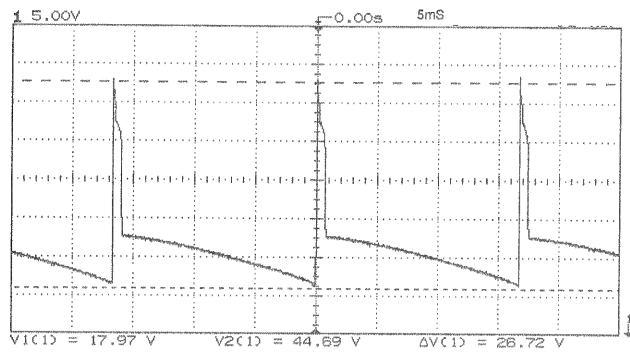
33 I601 pin# 2-V.OUT(TV)



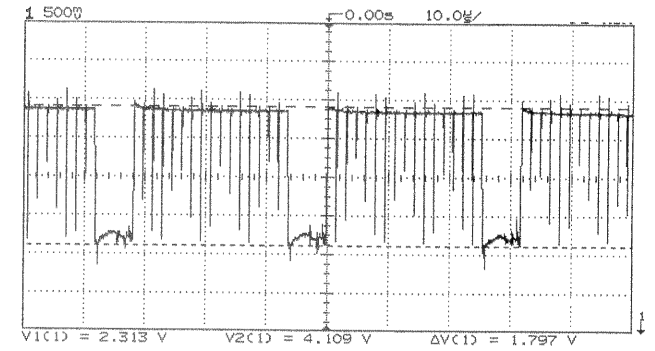
37 EX2A pin# 6-PC Red



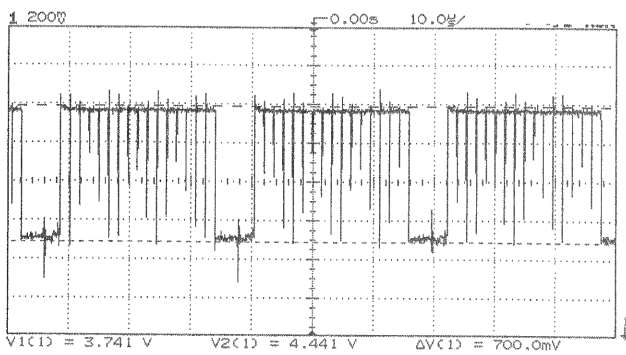
34 I601 pin# 2-V.OUT(PC)



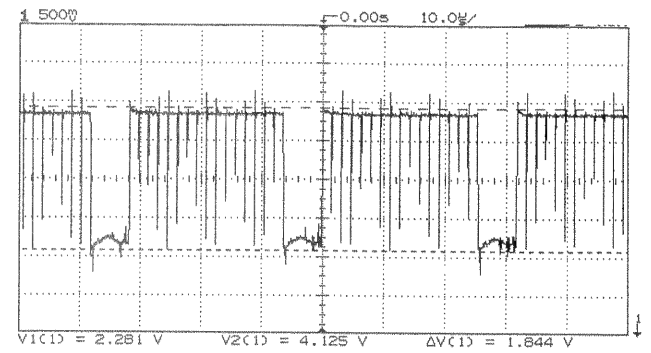
38 PJIG pin# 1-PC-Red OUT



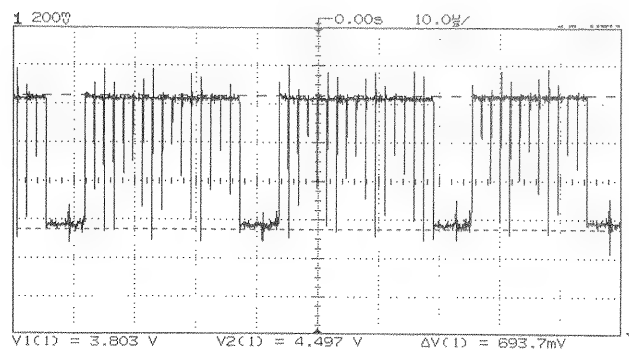
35 EX2A pin# 2-PC Blue



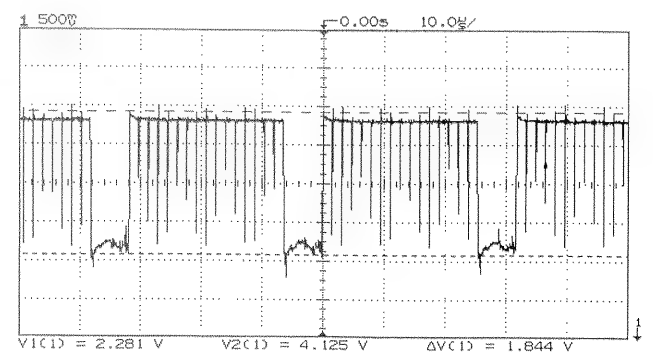
39 PJIG pin# 2-PC-Green OUT



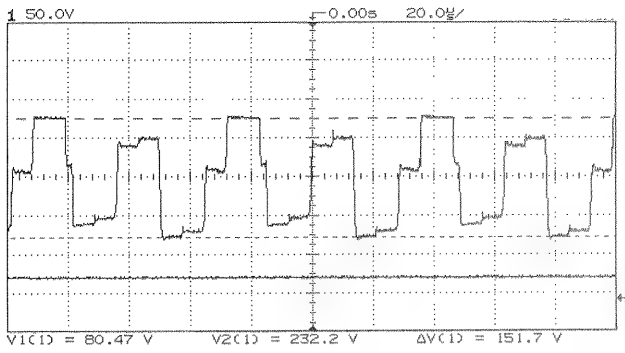
36 EX2A pin# 4-PC Green



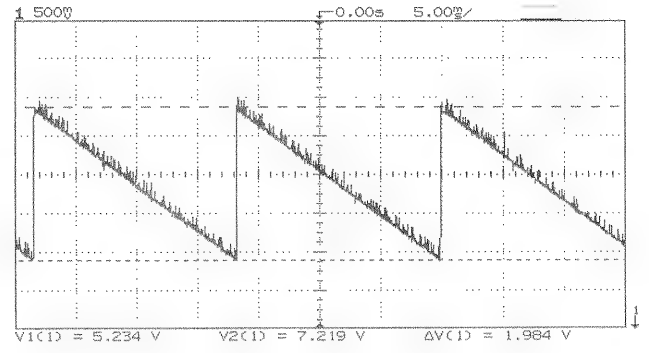
40 PJIG pin# 1-PC-Blue OUT



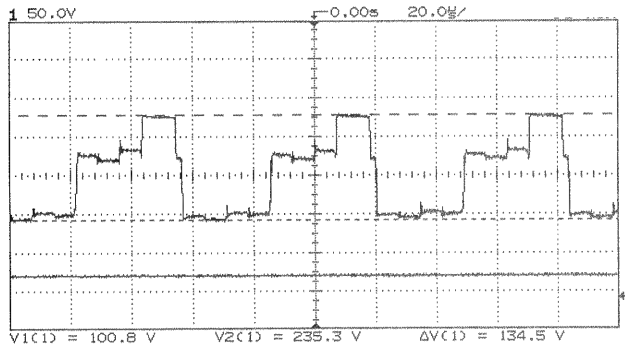
41 Q851(C) Red VIDEO OUT



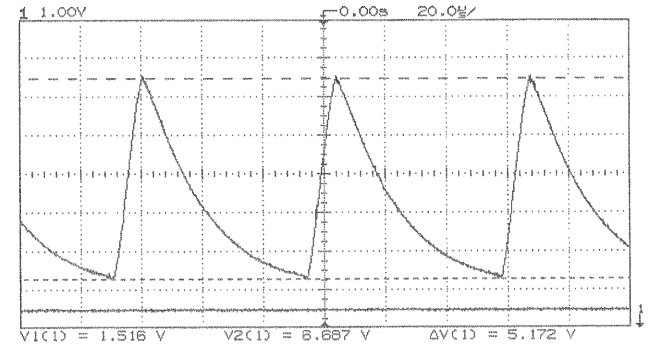
45 I621 pin# 3-(POS)



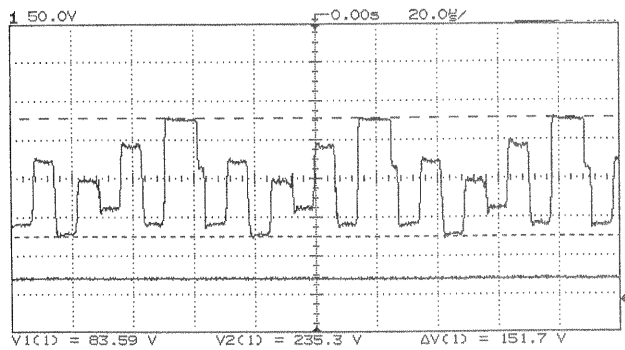
42 Q854(C) Green VIDEO OUT



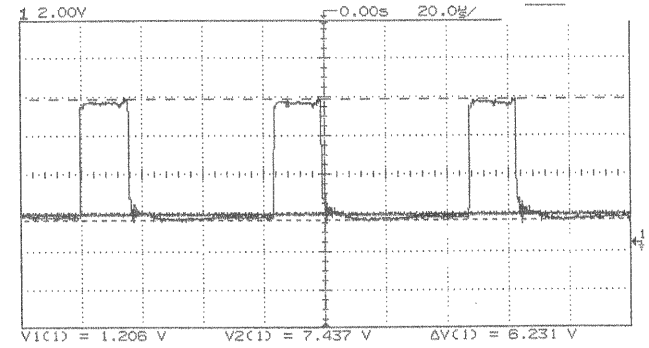
46 I621 pin# 2-(NEG)



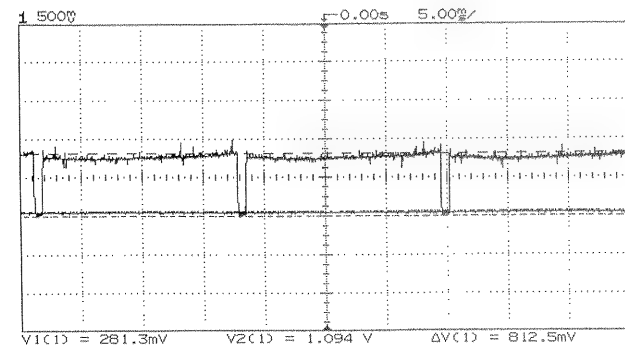
43 Q857(C) Blue VIDEO OUT



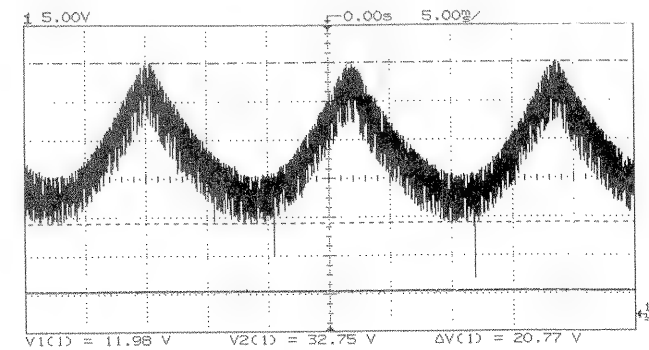
47 P67B pin# 10-H.SIZE




44 P67A pin# 6-V.OUT



48 P77B pin#5-HFB




REPLACEMENT PARTS LIST

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ABBREVIATIONS		
Capacitors:	Resistors:	Semiconductors:
CD: Ceramic Disc	CF: Carbon Film	TR: Transistor
PF: Polyesyter Film	CC: Carbon Composition	DI: Diode
EL: Electrolytic	MF: Metal Oxide Film	ZD: Zener Diode
PP: Polypropylene	VR: Variable Resistor	VA: Varistor
PR: Paper	WW: Wire Wound	TH: Thermistor
TA: Tantalum	FR: Fuse Resistor	IC: Integrated Circuit
TM: Trimmer	MG: Metal Glaze	Misc:
MC: Mylar		SC: Solder Coated

SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
		CAPACITORS			
C001	0800325R	CAP.-EL 100UF-M 10V	C204	0890089R	CAP.-CERAMIC 1500PF-K 50V
C003	0890087R	CAP.-CERAMIC 1000PF-K 50V	C205	0890089R	CAP.-CERAMIC 1500PF-K 50V
C004	0890076R	CAP.CERAMIC 150PF-K 50V	C206	0890089R	CAP.-CERAMIC 1500PF-K 50V
C006	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	C240	0890067R	CAP.-CERAMIC 33PF-J 50V
C007	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	C241	0890067R	CAP.-CERAMIC 33PF-J 50V
C009	0890078R	CAP.-CERAMIC 220PF-K 50V	C242	0890069R	CAP.-CERAMIC 47PF-J 50V
C00T	0283127	TRIMMER CAPACITOR (RED)	C245	0880009R	CAP.-POLYESTER 0.01UF-K 50V
C010	0890087R	CAP.-CERAMIC 1000PF-K 50V	C248	0880019R	CAP.-POLYESTER 0.33UF-KB 50V
C011	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	C290	0880009R	CAP.-POLYESTER 0.01UF-K 50V
C012	0880016R	CAP.-PF 0.1UF 50V	C301	0880016R	CAP.-PF 0.1UF 50V
C013	0890123R	CAP.-CERAMIC 47PF-J CH 50V	C304	0800282R	CAP.-EL 2.2UF-M(SMG) 50V
C015	0800351R	CAP.-EL 470UF-M 6.3V	C305	0800282R	CAP.-EL 2.2UF-M(SMG) 50V
C016	0890117R	CAP. CERAMIC 18PF-J 50V	C311	0800286R	CAP.-EL 4.7UF-M(SMG) 25V
C017	0890117R	CAP. CERAMIC 18PF-J 50V	C331	0800291R	CAP.-EL 10UF-M(SMG) 16V
C018	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	C381	0800326R	CAP.-EL 100UF-M 16V
C019	0800316R	CAP.-EL 47UF-M(SMG) 10V	C382	0800291R	CAP.-EL 10UF-M(SMG) 16V
C020	0880016R	CAP.-PF 0.1UF 50V	C383	0800326R	CAP.-EL 100UF-M 16V
C022	0800286R	CAP.-EL 4.7UF-M(SMG) 25V	C384	0880009R	CAP.-POLYESTER 0.01UF-K 50V
C023	0800291R	CAP.-EL 10UF-M(SMG) 16V	C385	0800291R	CAP.-EL 10UF-M(SMG) 16V
C024	0890074R	CAP.-CERAMIC 100PF-J 50V	C386	0800326R	CAP.-EL 100UF-M 16V
C028	0890087R	CAP.-CERAMIC 1000PF-K 50V	C387	0880009R	CAP.-POLYESTER 0.01UF-K 50V
C029	0800286R	CAP.-EL 4.7UF-M(SMG) 25V	C3Y1	0800291R	CAP.-EL 10UF-M(SMG) 16V
C02A	0800317R	CAP.-EL 47UF-M(SMG) 16V	C402	0880009R	CAP.-POLYESTER 0.01UF-K 50V
C02C	0890068R	CAP.-CERAMIC 39PF-J 50V	C404	0880016R	CAP.-PF 0.1UF 50V
C02D	0890068R	CAP.-CERAMIC 39PF-J 50V	C405	0880016R	CAP.-PF 0.1UF 50V
C02E	0890068R	CAP.-CERAMIC 39PF-J 50V	C406	0880012R	MYLAR CAPACITOR 0.022U 0204249C
C02F	0890123R	CAP.-CERAMIC 47PF-J CH 50V	C407	0800292R	CAP.-EL 10UF-M(SMG) 25V
C02G	0890064R	CAP.-CERAMIC 18PF-J SL 50V	C408	0880012R	MYLAR CAPACITOR 0.022U 0204249C
C030	0890074R	CAP.-CERAMIC 100PF-J 50V	C411	0800354R	CAP.-EL 470UF-M 25V
C031	0880016R	CAP.-PF 0.1UF 50V	C412	0800354R	CAP.-EL 470UF-M 25V
C040	0890087R	CAP.-CERAMIC 1000PF-K 50V	C414	0800354R	CAP.-EL 470UF-M 25V
C041	0800324R	CAP.-EL 100UF-M(SMG) 6.3V	C416	0800326R	CAP.-EL 100UF-M 16V
C042	0890084R	CAP.-CERAMIC 560PF-K 50V	C418	0800317R	CAP.-EL 47UF-M(SMG) 16V
C050	0880016R	CAP.-PF 0.1UF 50V	C419	0800353R	CAP.-EL470UF-M 16V
C051	0880016R	CAP.-PF 0.1UF 50V	C440	0800277R	CAP.-EL 0.47UF-M 50V
C052	0800324R	CAP.-EL 100UF-M(SMG) 6.3V	C441	0800286R	CAP.-EL 4.7UF-M(SMG) 25V
C061	0890077R	CAP.-CERAMIC 180PF-K 50V	C442	0880016R	CAP.-EL 100UF-M 10V
C062	0890077R	CAP.-CERAMIC 180PF-K 50V	C443	0880014R	MYLAR CAPACITOR 0.047U
C063	0890077R	CAP.-CERAMIC 180PF-K 50V	C444	0800101R	CAP.-EL 0.1UF-M 50V
C064	0890077R	CAP.-CERAMIC 180PF-K 50V	C445	0800279R	CAP.-EL 1.0UF-M(SMG) 50V
C100	0800291R	CAP.-EL 10UF-M(SMG) 16V	C446	0800286R	CAP.-EL 4.7UF-M(SMG) 25V
C101	0800324R	CAP.-EL 100UF-M(SMG) 6.3V	C447	0880016R	CAP.-PF 0.1UF 50V
C102	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	C448	0800299R	CAP.-EL 22UF-M(SMG) 16V
C103	0800361N	CAP.-ELECTRO 1000UF 16V	C450	0800279R	CAP.-EL 1.0UF-M(SMG) 50V
C104	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	C451	0800279R	CAP.-EL 1.0UF-M(SMG) 50V
C105	0880003R	MYLAR CAPACITOR 0.001U	C452	0800279R	CAP.-EL 1.0UF-M(SMG) 50V
C201	0800361N	CAP.-ELECTRO 1000UF 16V	C453	0292712F	CAP.-TA 3.3UF-K 16V
C202	0890072R	CAP.-CERAMIC 68PF-J 50V	C454	0292714F	CAP.-TA 10UF-K 16V
C203	0880014R	MYLAR CAPACITOR 0.047U	C455	0800279R	CAP.-EL 1.0UF-M(SMG) 50V
			C456	0800279R	CAP.-EL 1.0UF-M(SMG) 50V

REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
C461	0800317R	CAP.-EL 47UF-M(SMG) 16V	C620	0880009R	CAP.-POLYESTER 0.01UF-K 50V
C462	0800286R	CAP.-EL 4.7UF-M(SMG) 25V	C621	0880011R	MYLAR CAPACITOR 0.015UF
C463	0800286R	CAP.-EL 4.7UF-M(SMG) 25V	C622	0880016R	CAP.-PF 0.1UF 50V
C46A	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	C62E	0292716R	CAP.-TA 1.0UF-K 20V
C46C	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	C63E	0880003R	MYLAR CAPACITOR 0.001U
C471	0800286R	CAP.-EL 4.7UF-M(SMG) 25V	C64E	0800361N	CAP.-ELECTRO 1000UF 16V
C472	0800286R	CAP.-EL 4.7UF-M(SMG) 25V	C671	0800294R	CAP.-EL 10UF-M(SMG) 50V
C473	0890089R	CAP.-CERAMIC 1500PF-K 50V	C672	0800326R	CAP.-EL 100UF-M 16V
C47A	0890089R	CAP.-CERAMIC 1500PF-K 50V	C701	0800335R	CAP.-EL 220UF-M(SMG) 16V
C475	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	C702	0800335R	CAP.-EL 220UF-M(SMG) 16V
C476	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	C705	0253974F	CAP.-EL 33UF 250V CE04W2E330MF
C481	0800335R	CAP.-EL 220UF-M(SMG) 16V	C70A	0244210	CAP.-CERAMIC 820PF-K 2KV
C482	0800326R	CAP.-EL 100UF-M 16V	C70C	0244210	CAP.-CERAMIC 820PF-K 2KV
C483	0880009R	CAP.-POLYESTER 0.01UF-K 50V	C710	0244501R	CAP.-CERAMIC 1000PF-K 500V
C502	0890074R	CAP.-CERAMIC 100PF-J 50V	C711	0800355N	CAP.EL 470UF-M 35V
C503	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	△ C712	0279687R	CAP.-POLY 0.01UF-100V
C505	0800291R	CAP.-EL 10UF-M(SMG) 16V	△ C713	0262425F	CAP.-POLYESTER 0.0082UF 1.8KV
C506	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	△ C714	0262414F	CAP.POLYPRO 3300PF 1800V
C507	0880016R	CAP.-PF 0.1UF 50V	△ C716	0299930F	CAP.-POLYPRO. 0.22UF-K 200V
C509	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	△ C71A	0244210F	CAP.-CERAMIC 820PF-K 2KV
C510	0800277R	CAP.-EL 0.47UF-M 50V	△ C71C	0279687R	CAP.-POLY 0.01UF-100V
C511	0890061R	CAP.-CERAMIC 10PF- 50V	△ C71G	0262432F	CAP.-POLYPRO. 15000PF-J 1800V
C512	0880012R	MYLAR CAPACITOR 0.022U 0204249C	△ C71H	0299988F	CAP.-PP FILM 0.047UF-J 630V
C513	0800277R	CAP.-EL 0.47UF-M 50V	△ C71M	0262803F	CAP.-POLYPRO. 0.68UF-J 250V
C515	0880016R	CAP.-PF 0.1UF 50V	C720	0244503R	CAP.-CERAMIC 1500PF-K 500V TAPE
C516	0880016R	CAP.-PF 0.1UF 50V	△ C722	0299621	CAP.-PP FILM 0.0082UF-J 630V
C517	0880016R	CAP.-PF 0.1UF 50V	C72A	0299926F	CAP.-PF 0.1UF-K 200V
C518	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	C725	0880016R	CAP.-PF 0.1UF 50V
C519	0800326R	CAP.-EL 100UF-M 16V	C726	0880044R	CAP.-POLYESTER 0.01UF-KEB 50V
C520	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	C727	0800299R	CAP.-EL 22UF-M(SMG) 16V
C521	0800353R	CAP.-EL470UF-M 16V	C729	0800361N	CAP.-ELECTRO 1000UF 16V
C523	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	C72H	0800343R	CAP.-ELECTRO 330UF-M(SMG) 10V
C524	0800361N	CAP.-ELECTRO 1000UF 16V	△ C730	0243508R	CAP.-CERAMIC 390PF-K 500V
C525	0800282R	CAP.-EL 2.2UF-M(SMG) 50V	C731	0243508R	CAP.-CERAMIC 390PF-K 500V
C526	0244105R	CAP.-CERAMIC 2200PF-K 50V TAPE	△ C732	0253957F	CAP.-EL 22UF-M 160V
C527	0800353R	CAP.-EL470UF-M 16V	C73H	0800326R	CAP.-EL 100UF-M 16V
C551	0800326R	CAP.-EL 100UF-M 16V	C741	0244501R	CAP.-CERAMIC 1000PF-K 500V
C555	0244141R	CAP.-CERAMIC 0.01UF-KB B 50V	C742	0244501R	CAP.-CERAMIC 1000PF-K 500V
C556	0284623R	CAP.-EL 1UF-SME(BP) 50V	C743	0244501R	CAP.-CERAMIC 1000PF-K 500V
C558	0284623R	CAP.-EL 1UF-SME(BP) 50V	C745	0244505R	CAP.-CERAMIC 0.0022UF-K 500V
C561	0800282R	CAP.-EL 2.2UF-M(SMG) 50V	C746	0880059R	CAP.-POLYESTER 0.15UF-KEB 50V
C563	0800282R	CAP.-EL 2.2UF-M(SMG) 50V	C751	0880013R	MYLAR CAP. 0.033UF-K 50V
C565	0800282R	CAP.-EL 2.2UF-M(SMG) 50V	C752	0800279R	CAP.-EL 1.0UF-M(SMG) 50V
C568	0880016R	CAP.-PF 0.1UF 50V	C756	0800326R	CAP.-EL 100UF-M 16V
C582	0880016R	CAP.-PF 0.1UF 50V	C757	0880009R	CAP.-POLYESTER 0.01UF-K 50V
C586	0800326R	CAP.-EL 100UF-M 16V	C773	0244501	CAP. CERAMIC 1000PF-K 500V
C587	0880016R	CAP.-PF 0.1UF 50V	C774	0880009R	CAP.-POLYESTER 0.01UF-K 50V
C5C1	0880003R	MYLAR CAPACITOR 0.001U	△ C775	0259471R	CAP.EL 6.8UF-M (BP) 50V TAPE
C601	0880012R	MYLAR CAPACITOR 0.022U 0204249C	△ C776	0259471R	CAP.EL 6.8UF-M (BP) 50V TAPE
C602	0880059R	CAP.-POLYESTER 0.15UF-KEB 50V	C777	0800049R	CAP.-EL 100UF-M 16V
C603	0800291R	CAP.-EL 10UF-M(SMG) 16V	C778	0880057R	CAP.-POLYESTER 0.1UF-KEB 50V
C604	0890079R	CAP.-CERAMIC 270PF-K 50V	C781	0800317R	CAP.-EL 47UF-M(SMG) 16V
C606	0800328R	CAP. EL 100UF-M 35V	C782	0244507F	CAP.-CERAMIC 3300PF-K B 500V
C609	0800367N	CAP.-EL 2200UF-M 16V	C783	0800326R	CAP.-EL 100UF-M 16V
C60E	0880012R	MYLAR CAPACITOR 0.022U 0204249C	C783	0299926F	CAP.-PF 0.1UF-K 200V
C610	0880012R	MYLAR CAPACITOR 0.022U 0204249C	C788	0253862	CAP.-EL 220UF-M 160V
C613	0800007R	CAP.-EL 3.3UF-M 50V	C798	0800326R	CAP.-EL 100UF-M 16V
C618	0800326R	CAP.-EL 100UF-M 16V	C799	0800326R	CAP.-EL 100UF-M 16V
C619	0880007R	MYLAR CAPACITOR 0.0047UF 50V	C7S1	0880016R	CAP.-PF 0.1UF 50V
C61E	0800279R	CAP.-EL 1.0UF-M(SMG) 50V	C7S2	0244501R	CAP.-CERAMIC 1000PF-K 500V







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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
	C801	0890085R CAP.-CERAMIC 680PF-K 50V		CN01	0800291R CAP.-EL 10UF-M(SMG) 16V
	C802	0890084R CAP.-CERAMIC 560PF-K 50V		CN03	0890078R CAP.-CER. 220PF-K 50V
	C803	0890085R CAP.-CERAMIC 680PF-K 50V		CN06	0890074R CAP.-CER. 100PF-J 50V
	C851	0800326R CAP.-EL 100UF-M 16V		CN07	0880009R CAP.-POLYESTER 0.01UF-K 50V
	C859	0255524F CAP.-EL 4.7MF-M 250V(KME)		CN09	0800291R CAP.-EL 10UF-M(SMG) 16V
	C860	0244889 CAP.-CERAMIC 2200PF-K B 2KV		CN0A	0800317R CAP.-EL 47UF-M(SMG) 16V
	C866	0244171R CAP.-CERAMIC 0.01UF-Z F 50V TAPE		CN10	0800286R CAP.-EL 4.7UF-M(SMG) 25V
	C874	0880016R CAP.-PF 0.1UF 50V		CN11	0880008R MYLAR CAPACITOR 6800PF-K 50V
	C875	0880016R CAP.-PF 0.1UF 50V		CN12	0800286R CAP.-EL 4.7UF-M(SMG) 25V
	C876	0880016R CAP.-PF 0.1UF 50V		CN14	0800286R CAP.-EL 4.7UF-M(SMG) 25V
	C877	0890074R CAP.-CERAMIC 100PF-J 50V		CN15	0800286R CAP.-EL 4.7UF-M(SMG) 25V
	C878	0890074R CAP.-CERAMIC 100PF-J 50V		CN16	0880009R CAP.-POLYESTER 0.01UF-K 50V
	C879	0890074R CAP.-CERAMIC 100PF-J 50V		CN17	0880009R CAP.-POLYESTER 0.01UF-K 50V
△	C901	AN00144S PLASTIC FILM CAPACITOR(0.1UF250V)		CN40	0890083R CAP.-CER. 470PF-K 50V
△	C902	AN00144S PLASTIC FILM CAPACITOR(0.1UF250V)		CN41	0800361N CAP.-ELECTRO 1000UF 16V
△	C903	0249495F CAP.CERAMIC 4700P-FZ 125V		CN42	0880009R CAP.-POLYESTER 0.01UF-K 50V
△	C904	0249495F CAP.CERAMIC 4700P-FZ 125V		CN43	0246466R CAP.-CER. 120PF-J CH 50V
△	C905	0259168 CAP.-EL 820UF-M 200V (HR)		CN43A	0246466R CAP.-CER. 120PF-J CH 50V
△	C906	0800291R CAP.-EL 10UF-M(SMG) 16V		CN44	0246466R CAP.-CER. 120PF-J CH 50V
	C908	0800345R CAP.-EL 330UF-M(SMG) 25V		CN45	0800324R CAP.-EL 100UF-M(SMG) 6.3V
	C909	0890087R CAP.-CERAMIC 1000PF-K 50V		CN46	0880009R CAP.-POLYESTER 0.01UF-K 50V
	C911	0245611F CAP.-CERAMIC 3300PF-K 1000V		CN47	0880009R CAP.-POLYESTER 0.01UF-K 50V
	C913	0890083R CAP.-CERAMIC 470PF-K 50V		CN48	0800286R CAP.-EL 4.7UF-M(SMG) 25V
	C915	0880004R MYLAR CAPACITOR 0.0015U		CN49	0246466R CAP.-CER. 120PF-J CH 50V
△	C930	0249392F CAP.-CERAMIC 2200PF 125V		CN4A	0246466R CAP.-CER. 120PF-J CH 50V
	C931	0243507R CAP.-CERAMIC 330PF-K 500V TAPE		CN52	0246466R CAP.-CER. 120PF-J CH 50V
	C932	0800335R CAP.-EL 220UF-M(SMG) 16V		CN61	0800326R CAP.-EL 100UF-M 16V
	C933	0243507R CAP.-CERAMIC 330PF-K 500V TAPE		CN62	0880009R CAP.-POLYESTER 0.01UF-K 50V
	C935	0800361N CAP.-ELECTRO 1000UF 16V		CN63	0800291R CAP.-EL 10UF-M(SMG) 16V
	C936	0251704 ELECTROLYTIC CAPACITOR (KMH 470/160V)		CN71	0800279R CAP.-EL 1.0UF-M(SMG) 50V
	C938	0800368N CAP.-EL 2200UF-M 25V		CN72	0800353R CAP.-EL470UF-M 16V
	C939	0800333R CAP.-EL220UF-M 6.3V		CN73	0880009R CAP.-POLYESTER 0.01UF-K 50V
	C940	0880016R CAP.-PF 0.1UF 50V		CN74	0880009R CAP.-POLYESTER 0.01UF-K 50V
	C941	0800279R CAP.-EL 1.0UF-M(SMG) 50V		CN75	0292716R CAP.-TA 1.0UF-K 20V
	C942	0800333R CAP.-EL220UF-M 6.3V		CN76	0800279R CAP.-EL 1.0UF-M(SMG) 50V
	C945	0800333R CAP.-EL220UF-M 6.3V		CN78	0244105R CAP.-CER. 2200PF-K 50V TAPE
	C948	0800326R CAP.-EL 100UF-M 16V		CN79	0800361N CAP.-ELECTRO 1000UF 16V
△	C953	0800294R CAP.-EL 10UF-M(SMG) 50V		CN7A	0880009R CAP.-POLYESTER 0.01UF-K 50V
△	C955	0800336R CAP.-EL 220UF-M(SMG) 25V		CN7F	0800279R CAP.-EL 1.0UF-M(SMG) 50V
	C956	0244889 CAP.-CERAMIC 2200PF-K B 2KV		CN7G	0880008R MYLAR CAPACITOR 6800PF-K 50V
	C957	0800326R CAP.-EL 100UF-M 16V		CN7H	0880011R MYLAR CAPACITOR 0.015UF
	C959	0800286R CAP.-EL 4.7UF-M(SMG) 25V		CN7J	0880008R MYLAR CAPACITOR 6800PF-K 50V
△	C981	0249392F CAP.-CERAMIC 2200PF 125V		CN7K	0284623R CAP.-EL 1UF-SME(BP) 50V
△	C983	0249392F CAP.-CERAMIC 2200PF 125V		CN7L	0299009R CAP.-POLY.FLM 0.0022UF 100V
	CA26	0800291R CAP.-EL 10UF-M(SMG) 16V		CN90	0800326R CAP.-EL 100UF-M 16V
	CA28	0800291R CAP.-EL 10UF-M(SMG) 16V		CN91	0800353R CAP.-EL470UF-M 16V
	CA38	0800317R CAP.-EL 47UF-M(SMG) 16V		CP01	0800082N CAP.-EL 1000UF-MB16V(SME)
	CC31	0880016R CAP.-PF 0.1UF 50V		CP51	0890072R CAP.-CER 68PF-J 50V
	CC32	0880009R CAP.-POLYESTER 0.01UF-K 50V		CP52	0890072R CAP.-CER 68PF-J 50V
	CC33	0880009R CAP.-POLYESTER 0.01UF-K 50V		CP53	0890072R CAP.-CER. 68PF-J 50V
	CC34	0880009R CAP.-POLYESTER 0.01UF-K 50V		CP54	0800326R CAP.-EL 100UF-M 16V
	CC36	0800286R CAP.-EL 4.7UF-M(SMG) 25V		CR403	0800041R CAP.-EL 47UF-M 16V
	CC37	0800286R CAP.-EL 4.7UF-M(SMG) 25V		CR404	0800041R CAP.-EL 47UF-M 16V
	CC38	0880009R CAP.-POLYESTER 0.01UF-K 50V		CS01	0800291R CAP.-EL 10UF-M(SMG) 16V
	CC39	0800353R CAP.-EL470UF-M 16V		CS02	0880009R CAP.-POLYESTER 0.01UF-K 50V
	CC40	0890078R CAP.-CERAMIC 220PF-K 50V		CS03	0880203R CAP.-POLYESTER 0.47UF-J 50V
	CC55	0284623R CAP.-EL 1UF-SME(BP) 50V		CS04	0880012R MYLAR CAPACITOR 0.022U 0204249C
CDT41	0890073R CAP.-CERAMIC 82PF-J 50V		CS05	0880009R CAP.-POLYESTER 0.01UF-K 50V	
CDT42	0890073R CAP.-CERAMIC 82PF-J 50V		CS06	0800326R CAP.-EL 100UF-M 16V	
CDT43	0890073R CAP.-CERAMIC 82PF-J 50V		CSA0	0890074R CAP.-CER. 100PF-J 50V	

REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
CSA1	0800324R	CAP.-EL 100UF-M(SMG) 6.3V	D022	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CSA2	0880009R	CAP.-POLYESTER 0.01UF-K 50V	D023	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CSA3	0880016R	CAP.-PF 0.1UF 50V	D024	2339889M	ZENER HZS12 (C3) 0.005A
CSA4	0800317R	CAP.-EL 47UF-M(SMG) 16V	D101	2339837M	ZENER HZS-5C1 TAPE
CSA6	0880012R	MYLAR CAPACITOR 0.022U 0204249C	D102	2339971M	ZENER HZS33-1 TA
CSA7	0880203R	CAP.-POLYESTER 0.47UF-J 50V	D271	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CSA8	0880009R	CAP.-POLYESTER 0.01UF-K 50V	D301	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CSA9	0890074R	CAP.-CER. 100PF-J 50V	D381	2339839M	ZENER HZS5C3 TAPE
CSE1	0800335R	CAP.-EL 220UF-M(SMG) 16V	D404	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CT02	0800286R	CAP.-EL 4.7UF-M(SMG) 25V	D405	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CT03	0890089R	CAP.-CER. 1500PF-K 50V	D406	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CT04	0800326R	CAP.-EL 100UF-M 16V	D407	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CT05	0890089R	CAP.-CER. 1500PF-K 50V	D407	2339867M	ZENER HZS-9-C1 TAPE (SI.200MA)
CT11	0800291R	CAP.-EL 10UF-M(SMG) 16V	D408	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CT12	0800291R	CAP.-EL 10UF-M(SMG) 16V	D501	2339819M	ZENER HZS3C3 TA
CT13	0800291R	CAP.-EL 10UF-M(SMG) 16V	D507	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CT15	0800082N	CAP.-EL 1000UF-MB16V(SME)	D508	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CVC1	0800277R	CAP.-EL 0.47UF-M 50V	D509	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CVC2	0800337R	CAP.-EL 220UF 35V (SMG TY PE)	D510	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW01	0284621R	CAP.-EL 0.47UF 50V (BP)	D563	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW04	0890081R	CAP.-CER. 330PF 50V	D564	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW05	0800326R	CAP.-EL 100UF-M 16V	D565	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW06	0880009R	CAP.-POLYESTER 0.01UF-K 50V	D581	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW09	0890074R	CAP.-CER. 100PF-J 50V	D601	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW10	0244541F	CAPACITOR-CER. 0.01MF-K B 500V	D604	2339491M	DIODE AM01Z (200 TAPE) 1A
CW11	0890074R	CAP.-CER. 100PF-J 50V	D605	2339971M	ZENER HZS33-1 TA
CW12	0244509R	CAP.-CER. 4700PF-KB B 500V	D606	2339971M	ZENER HZS33-1 TA
CW13	0253959F	CAP.-EL 47UF-M 160V	D607	2339867M	ZENER HZS-9-C1 TAPE (SI.200MA)
CW14	0253959F	CAP.-EL 47UF-M 160V	D60E	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW15	0253957F	CAP.-EL 22UF-M 160V	D61E	2339889M	ZENER HZS12 (C3) 0.005A
CW16	0247848R	CAP.-CER. 56PF-J SL 500V	D621	2339881M	ZENER HZS12A1 TA
CW17	0800353R	CAP.-EL 470UF-M 16V	D622	2339889M	ZENER HZS12 (C3) 0.005A
CW18	0880009R	CAP.-POLYESTER 0.01UF-K 50V	D671	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW19	0253959F	CAP.-EL 47UF-M 160V	D672	2339892M	DIODE (HZS15-2TA)
CW20	0244541F	CAPACITOR-CER. 0.01MF-K B 500V	D6N1	2339867M	ZENER HZS-9-C1 TAPE (SI.200MA)
CW22	0880016R	CAP.-PF 0.1UF 50V	D702	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW23	0800326R	CAP.-EL 100UF-M 16V	D703	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW24	0800317R	CAP.-EL 47UF-M(SMG) 16V	D704	2339867M	ZENER HZS-9-C1 TAPE (SI.200MA)
CW27	0880009R	CAP.-POLYESTER 0.01UF-K 50V	D705	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CW28	0890077R	CAP.-CER. 180PF-K 50V	 D706	2339223M	ZENER HZS27 (3L)
CY39	0800291R	CAP.-EL 10UF-M(SMG) 16V	D707	2339882M	ZENER DIODE HZS-12(A2) TAPE
CY42	0880016R	CAP.-PF 0.1UF 50V	D708	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CY43	0800324R	CAP.-EL 100UF-M(SMG) 6.3V	D70A	CH00031M	DIODE AU02V1(280V)
CY44	0880016R	CAP.-PF 0.1UF 50V	D710	2338944	DIODE FML-G12S (F) (200V) SI 0.04USEC
CY45	0890121R	CAP.-CER. 33PF-J CH 50V	 D712	CH00551F	DIODE FMQ-G5FS LF715 1500V
CY46	0890121R	CAP.-CER. 33PF-J CH 50V	 D714	2344071	DIODE ERC20M-04
CY47	0890123R	CAP.-CER. 47PF-J CH 50V	D717	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
CY48	0890123R	CAP.-CER. 47PF-J CH 50V	 D718	2339242M	ZENER HZS332L TAPE
CY49	0880016R	CAP.-PF 0.1UF 50V	 D719	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
		DIODES	 D725	2339481M	DIODE AS01Z (200 TAPE) SI 0.6A
D001	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D72H	2336612M	DIODE RU3AM TA
D002	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D730	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
D005	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D732	2339481M	DIODE AS01Z (200 TAPE) SI 0.6A
D007	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D733	CH00031M	DIODE AU02V1(280V)
D008	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D735	2339869M	ZENER HZS9C3 TA
D009	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D73H	2339848M	ZENER HZS-6-C2 TAPE
D010	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D744	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
D011	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D74H	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC
D020	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D751	2339491M	DIODE AM01Z (200 TAPE) 1A
D021	2398611M	DIODE 1SS254 TAPE (35V) SI 4NSEC	D752	2339491M	DIODE AM01Z (200 TAPE) 1A

REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
	D752	2339867M ZENER HZS-9-C1 TAPE (SI.200MA)		DD05	2339889M ZENER HZS12 (C3) 0.005A
	D754	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DD06	2339889M ZENER HZS12 (C3) 0.005A
	D755	2339481M DIODE AS01Z (200 TAPE) SI 0.6A		DD07	2339889M ZENER HZS12 (C3) 0.005A
	D756	2339481M DIODE AS01Z (200 TAPE) SI 0.6A		DD08	2339889M ZENER HZS12 (C3) 0.005A
	D75H	2339491M DIODE AM01Z (200 TAPE) 1A		DD09	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D771	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DD09A	2339889M ZENER HZS12 (C3) 0.005A
	D772	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DD10	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D773	2339828M ZENER HZS-4C TAPE		DD10A	2339889M ZENER HZS12 (C3) 0.005A
	D774	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DD11	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D775	2339481M DIODE AS01Z (200 TAPE) SI 0.6A		DD11A	2339889M ZENER HZS12 (C3) 0.005A
	D776	2343961M DIODE MPG06D G23 TA		DD12	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D777	2343961M DIODE MPG06D G23 TA		DD12A	2339889M ZENER HZS12 (C3) 0.005A
	D778	2343961M DIODE MPG06D G23 TA		DD13	2339889M ZENER HZS12 (C3) 0.005A
	D779	2343961M DIODE MPG06D G23 TA		DD16	2339889M ZENER HZS12 (C3) 0.005A
	D785	2339491M DIODE AM01Z (200 TAPE) 1A		DD17	2339889M ZENER HZS12 (C3) 0.005A
	D78A	2339882M ZENER DIODE HZS-12(A2) TAPE		DD18	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D78C	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DD19	2339889M ZENER HZS12 (C3) 0.005A
	D801	2339821M ZENER HZS4A1 TA		DK109	2339481M DIODE AS01Z (200 TAPE) SI 0.6A
	D804	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DK276	2339481M DIODE AS01Z (200 TAPE) SI 0.6A
	D805	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DK436	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D806	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DK437	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D820	2339601M ZENER HZS-2 TAPE (ALL) SI 400MW 2.0V		DK438	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D821	2339601M ZENER HZS-2 TAPE (ALL) SI 400MW 2.0V		DMS1	2339887M ZENER HZS12C1 TA
	D822	2339601M ZENER HZS-2 TAPE (ALL) SI 400MW 2.0V		DMS2	2339887M ZENER HZS12C1 TA
	D823	2339868M ZENER HZS9C2 TAPE		DN01	2339839M ZENER HZS5C3 TAPE
	D825	2339868M ZENER HZS9C2 TAPE		DN02	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D826	2339868M ZENER HZS9C2 TAPE		DN05	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D855	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DN41	2339881M ZENER HZS12A1 TA
	D856	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DN42	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D857	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DN43	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D858	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DN44	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
△	D901	2342062 DIODE D3SBA60-4103		DN70	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D902	2339481M DIODE AS01Z (200 TAPE) SI 0.6A		DN72	2339872M ZENER HZS11A2 TA
	D903	2334324M ZENER DIODE RD36E TAPE (B3) SI 500MW 36		DN90	2339839M ZENER HZS5C3 TAPE
	D905	2339481M DIODE AS01Z (200 TAPE) SI 0.6A		DN91	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D906	2339481M DIODE AS01Z (200 TAPE) SI 0.6A		DN92	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D908	2339835M ZENER HZS5B2 TAPE		DP01	2339869M ZENER HZS9C3 TA
	D909	2339481M DIODE AS01Z (200 TAPE) SI 0.6A		DSA1	2339837M ZENER HZS-5C1 TAPE
	D910	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DVC1	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D931	2339491M DIODE AM01Z (200 TAPE) 1A		DVC2	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D932	2338944 DIODE FML-G12S (F) (200V) SI 0.04USEC		DVC3	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D934	2349861 DIODE FMU-G16S		DW01	2339491M DIODE AM01Z (200 TAPE) 1A
	D936	2338944 DIODE FML-G12S (F) (200V) SI 0.04USEC		DW02	2339491M DIODE AM01Z (200 TAPE) 1A
	D937	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DW03	2339491M DIODE AM01Z (200 TAPE) 1A
	D938	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DW04	2339491M DIODE AM01Z (200 TAPE) 1A
	D939	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DW05	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D93A	2339835M ZENER HZS5B2 TAPE		DW06	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
△	D940	2339222M ZENER HZS27-2L		DW11	2339491M DIODE AM01Z (200 TAPE) 1A
	D941	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DW12	2339491M DIODE AM01Z (200 TAPE) 1A
	D946	2339882M ZENER DIODE HZS-12(A2) TAPE		DX12	2339889M ZENER HZS12 (C3) 0.005A
	D947	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DX14	2339889M ZENER HZS12 (C3) 0.005A
△	D955	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DX17	2339889M ZENER HZS12 (C3) 0.005A
	D962	2339491M DIODE AM01Z (200 TAPE) 1A		DX32	2339889M ZENER HZS12 (C3) 0.005A
	D963	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DX33	2339889M ZENER HZS12 (C3) 0.005A
	D964	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DY10	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	D974	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC		DY11	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	DD01	2339889M ZENER HZS12 (C3) 0.005A		DY12	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	DD02	2339889M ZENER HZS12 (C3) 0.005A		DY13	2398611M DIODE 1SS254 TAPE (35V) SI 4NSEC
	DD03	2339889M ZENER HZS12 (C3) 0.005A			
	DD04	2339889M ZENER HZS12 (C3) 0.005A	△	F601	2722382 FUSES FUS-DC0.75A-J/UL(L)

REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
△ F701	2722385	FUSE DC2A	L611	2123781R	FILTER COIL 101K
△ F901	2722359	FUSE AC06A	L612	2123781R	FILTER COIL 101K
△ F902	2722357	FUSE AC04A	L701	2122248M	COIL-AXIAL 47UH-K
		SPARK GAPS	△ L702	BZ02052	LINE COIL 4UH PA1
G801	2340037	SPARK GAP	△ L703	2275802	LINEARITY COIL 10UH
△ G901	2340741	SURGE PROTECTOR DSP-301N-S00B	△ L704	BZ02001	DUMMY DY (27V)
		COMPOUND COMPONENTS	L705	2122652M	FERRITE CORE
H001	2791754R	CONDENSER WITH 3 TERMINAL 100PF	L706	2122652M	FERRITE CORE
H003	2791754R	CONDENSER WITH 3 TERMINAL 100PF	L714A	2771892	FERRITE BEADS CORE (004)
△ H901	2793313	CP-EXN-G131P365L	L714B	2771892	FERRITE BEADS CORE (004)
H902	0000000	UNFIXED PART	L71H	2771892	FERRITE BEADS CORE (004)
		INTEGRATED CIRCUITS	L722A	2771892	FERRITE BEADS CORE (004)
I001	CP04281	M37271MF-SP	L722B	2771892	FERRITE BEADS CORE (004)
I002	CP01992U	ST24C04FB6	△ L751	BZ00843	CHOKE COIL 330UH SL1720
I003	CZ00461	BIPOLAR SYSTEM RESET IC	L752	2122652M	FERRITE CORE
I004	CP00871U	DIGITAL MONOLITHIC IC (M62393P)	L753	BH00561	COIL HC-331K-1
△ I201	CP04301	TA1268N	L771	2122253M	COIL-AXIAL 100UH-K
I381	2003981	IC BA7604N	△ L774	BZ00848	CHOKE COIL 2200UH SL1720
△ I402	CP04041	UPC1854CT	L775	BZ00841	CHOKE COIL 150UH SL1720
△ I403	CP04061	ANALOG MONOLITHIC IC (LA4603)	L851	2122243M	COIL-AXIAL 18UH-K
△ I483	2366301	IC UPD4052BC	L852	2122243M	COIL-AXIAL 18UH-K
I551	CP00531U	IC M52320SP	L853	2122243M	COIL-AXIAL 18UH-K
I552	2362651	IC HD14053B	L854	2122249M	COIL-AXIAL 56UH-K
△ I601	2913981	IC AN5521	L855	2122249M	COIL-AXIAL 56UH-K
△ I602	CP00722U	ANALOG MONOLITHIC IC (TA8859CP)	L856	2122249M	COIL-AXIAL 56UH-K
△ I621	2365452	IC NJM2903D	L860	2123468M	FERRITE BEADS CORE LEAD 0.8MH
I671	2020507	IC AN7812F	L861	2123468M	FERRITE BEADS CORE LEAD 0.8MH
△ I7S1	2000465	IC PS2501-1 (KC/LC)	L862	2123468M	FERRITE BEADS CORE LEAD 0.8MH
△ I901	CT00004	STR-F6516	L884	2122253M	COIL-AXIAL 100UH-K
△ I902	2000465	IC PS2501-1 (KC/LC)	△ L901	2169462	LINE FILTER COIL FX-7355-60
△ I904	2000465	IC PS2501-1 (KC/LC)	△ L902	2169462	LINE FILTER COIL FX-7355-60
△ I931	2381344	IC SE130N	△ L904	2124365	DC NOISE FILTER
△ IN01	CP02821U	ANALOG MONOLITHIC IC (M52347SP)	L905	2123461M	FERRITE BEADS B 0.8 MH
△ IN40	2005491	IC-HD74HC221P	L905	2165747	COIL-DEGAUSSING
△ IN41	2005491	IC-HD74HC221P	L906	2123461M	FERRITE BEADS B 0.8 MH
△ IN6A	2362651	IC HD14053B	L907	2123461M	FERRITE BEADS B 0.8 MH
△ IN71	2364181	IC HA11423	L908	2123461M	FERRITE BEADS B 0.8 MH
IP01	2363191	INTEGRATED CIRCUIT HD14066BP	L909	2123461M	FERRITE BEADS B 0.8 MH
ISA1	CP01831	ANALOG MONOLITHIC IC (M62420SP)	L910	2123461M	FERRITE BEADS B 0.8 MH
△ IY02	CP04461	M37470M4-751SP	L930	2123461M	FERRITE BEADS B 0.8 MH
IY03	CZ00461	BIPOLAR SYSTEM RESET IC	L931	BH00206R	FILTER COIL 27UH
		COILS/INDUCTORS	L932	2123461M	FERRITE BEADS B 0.8 MH
L001	BH00101	OSC COIL	L933	2123461M	FERRITE BEADS B 0.8 MH
L003	BH00214R	FILTER COIL 100UH	L934	2123461M	FERRITE BEADS B 0.8 MH
L010	BH00214R	FILTER COIL 100UH	L935	2123461M	FERRITE BEADS B 0.8 MH
L011	BH00689R	COIL 27UH	L936	2123461M	FERRITE BEADS B 0.8 MH
L012	2771892	FERRITE BEADS CORE (004)	L937	BH00206R	FILTER COIL 27UH
L013	2771892	FERRITE BEADS CORE (004)	L950	BZ01932	DC NOISE FILTER
L014	2771892	FERRITE BEADS CORE (004)	LA02	2122253M	COIL-AXIAL 100UH-K
L015	2771892	FERRITE BEADS CORE (004)	LJ801	9374575	UL CSA1007-24HP CODE GREEN
L051	2122253M	COIL-AXIAL 100UH-K	LK133	2122253M	COIL-AXIAL 100UH-K
L052	2122253M	COIL-AXIAL 100UH-K	LK415	2122956M	COIL-AXIAL 100UHKM BELTING
L101	2122253M	COIL-AXIAL 100UH-K	LK433	2122956M	COIL-AXIAL 100UHKM BELTING
L201	BJ00131	VCO TANK COIL 52.37MHZ	LN01	2122253M	COIL-AXIAL 100UH-K
L240	BH00689R	COIL 27UH	LN40	2122253M	COIL-AXIAL 100UH-K
L242	BH00685R	COIL 12UH	LN41	2122253M	COIL-AXIAL 100UH-K
L243	BH00689R	COIL 27UH	LN43	2122253M	COIL-AXIAL 100UH-K
L381	2122253M	COIL-AXIAL 100UH-K	LP01	2122253M	COIL-AXIAL 100UH-K
L381	2123781R	FILTER COIL 101K	LT01	2122253M	COIL-AXIAL 100UH-K
L502	2123781R	FILTER COIL 101K	LT02	2122253M	COIL-AXIAL 100UH-K

REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
LT12	2122956M	COIL-AXIAL 100UHKM BELTING	Q781	2320647M	TRS. 2SC1213 (C/D)
LW01	2122943M	COIL-AXIAL 10UHKM BELTING	Q782	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
LW02	2123468M	FERRITE BEADS CORE LEAD 0.8MH	Q783	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
LW03	2123468M	FERRITE BEADS CORE LEAD 0.8MH	Q7S1	2320647M	TRS. 2SC1213 (C/D)
LW04	2123468M	FERRITE BEADS CORE LEAD 0.8MH	Q851	2315491	TRS. 2SC4544
LY03	2122956M	COIL-AXIAL 100UHKM BELTING	Q852	2320591M	TRS. 2SC458 (B /C) SI 230MHZ200MW
		TRANSISTORS	Q853	2320637M	TRS. 2SA673 (C/D)
Q001	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q854	2315491	TRS. 2SC4544
Q002	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q855	2320591M	TRS. 2SC458 (B /C) SI 230MHZ200MW
Q003	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q856	2320637M	TRS. 2SA673 (C/D) SI 80MHZ 400MW
Q004	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q857	2315491	TRS. 2SC4544
Q005	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q858	2320591M	TRS. 2SC458 (B /C) SI 230MHZ200MW
Q006	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q859	2320637M	TRS. 2SA673 (C/D)
Q007	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	 Q901	2323782R	THYRISTOR 03P2M(TA)
Q008	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	 Q905	2323782R	THYRISTOR 03P2M(TA)
Q009	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q907	2320637M	TRS. 2SA673 (C/D)
Q00A	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q908	2327883M	TRS. 2SA1207 (S/T) SI 150MHZ600MW
Q010	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q909	2320637M	TRS. 2SA673 (C 26/D 26)
Q011	2320637M	TRS. 2SA673 (C 26/D 26) SI 80MHZ 400MW	Q914	2320647M	TRS. 2SC1213 (C 21 /D 21)
Q012	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	Q958	2320647M	TRS. 2SC1213 (C 21 /D 21)
Q240	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QA01	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q241	2320637M	TRS. 2SA673 (C 26/D 26) SI 80MHZ 400MW	QA02	2320637M	TRS. 2SA673 (C 26/D 26)
Q242	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QA03	2320637M	TRS. 2SA673 (C 26/D 26)
Q271	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QA04	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q301	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN05	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q381	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN06	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q402	2320647M	TRS. 2SC1213 (C 21 /D 21) SI 80MHZ400MW	QN07	2320637M	TRS. 2SA673 (C 26/D 26)
Q411	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN08	2320637M	TRS. 2SA673 (C 26/D 26)
Q461	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN41	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q462	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN61	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q481	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN6A	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q482	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN6C	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q520	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN70	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q553	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN71	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q557	2320637M	TRS. 2SA673 (C 26/D 26) SI 80MHZ 400MW	QN72	2320637M	TRS. 2SA673 (C 26/D 26)
Q559	2320637M	TRS. 2SA673 (C 26/D 26) SI 80MHZ 400MW	QN73	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q561	2320637M	TRS. 2SA673 (C 26/D 26) SI 80MHZ 400MW	QN74	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q578	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN75	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q581	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QN90	2323434	TRS. 2SC1983 (O/Y)
Q582	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QP01	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q583	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QP02	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q584	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QP03	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q603	2320664R	TRS.2SC1213A(B/C)TAPE	QP04	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q604	2320637M	TRS. 2SA673 (C 26/D 26) SI 80MHZ 400MW	QQ01	2320637M	TRS. 2SA673 (C 26/D 26)
 Q701	2315391	TRS. 2SC4793	QQ06	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
 Q702	CF01541F	2SC2514 F	QQ07	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q705	2323434	TRS. 2SC1983 (O/Y)	QQ08	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q706	2320637M	TRS. 2SA673 (C 26/D 26) SI 80MHZ 400MW	QSA1	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q707	2323434	TRS. 2SC1983 (O/Y)	QT11	2320637M	TRS. 2SA673 (C 26/D 26)
Q72H	2323434	TRS. 2SC1983 (O/Y)	QT12	2320637M	TRS. 2SA673 (C 26/D 26)
Q751	2323526M	TRS. 2SD789 D/E TAPE	QT13	2320637M	TRS. 2SA673 (C 26/D 26)
Q752	2323526M	TRS. 2SD789 D/E TAPE	QT14	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q753	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QT15	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
 Q754	CF00931U	TRS. 2SK2382 200V	QT16	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
 Q756	CF00921F	TRS. FS7KM-18A 900V	QVC1	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW
Q757	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QVC3	2323526M	TRS. 2SD789 D/E TAPE
Q771	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QVC4	2323531	TRS. 2SB740 (B/C) SI 65MHZ 0.9W
Q772	2320637M	TRS. 2SA673 (C 26/D 26) SI 80MHZ 400MW	QW02	2320598M	TRS. 2SC458 (B /C /D)
Q773	2320596M	TRS. 2SC458 (C /D) SI 230MHZ200MW	QW03	2320598M	TRS. 2SC458 (B /C /D)
 Q774	2321591	TRS. 2SD401A (3 K)	QW04	2320598M	TRS. 2SC458 (B /C /D)

REPLACEMENT PARTS LIST

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
SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
QW04	2320598M	TRS. 2SC458 (B TZ/C TZ/D TZ)	R037	0700064M	RES.-CARBON FLM 1/16W 56K-JB
QW05	2320598M	TRS. 2SC458 (B TZ/C TZ/D TZ)	R038	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
QW06	2320598	TRS. 2SC458 (B/C/D)	R039	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
QW07	2320647M	TRS. 2SC1213 (C 21 TZ/D 21 TZ) SI 80MHZ400	R040	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
QW08	2321351M	TRS. 2SA836/844D/E 100MA 200MW 200MHZSI	R042	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
QW09	2315381	TRS. 2SA1837	R043	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
QW10	2315391	TRS. 2SC4793	R044	0700027M	RES.-CARBON FLM 1/16W 100-JB
QW11	2320598M	TRS. 2SC458 (B TZ/C TZ/D TZ)	R045	0700027M	RES.-CARBON FLM 1/16W 100-JB
QW12	2320598M	TRS. 2SC458 (B TZ/C TZ/D TZ)	R046	0700027M	RES.-CARBON FLM 1/16W 100-JB
QW13	2320596M	TRS. 2SC458 (C TZ/D TZ) SI 230MHZ200MW	R047	0700027M	RES.-CARBON FLM 1/16W 100-JB
QY44	2320596M	TRS. 2SC458 (C TZ/D TZ) SI 230MHZ200MW	R048	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB
QY45	2320596M	TRS. 2SC458 (C TZ/D TZ) SI 230MHZ200MW	R049	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
RESISTORS			R050	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R001	0700042M	RES.-CARBON FLM 1/16W 1.2K-JB	R051	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R002	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R052	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R003	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB	R053	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R004	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB	R054	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R005	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	R055	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R006	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R056	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R00A	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	R058	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R00H	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	R059	0700027M	RES.-CARBON FLM 1/16W 100-JB
R010	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R05A	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R011	0700058M	RES.-CARBON FLM 1/16W 22K-JB	R05F	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R012	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R05G	0700032M	RES.-CARBON FLM 1/16W 220-JB
R013	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	R060	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB
R014	0700063M	RES.-CARBON FLM 1/16W 47K-JB	R061	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB
R015	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R062	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R016	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R063	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R017	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R064	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R018	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R065	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R01A	0100065M	RES.-CARBON FLM 1/8W 1K-JB	R066	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R01C	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R067	0700027M	RES.-CARBON FLM 1/16W 100-JB
R01E	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R068	0700027M	RES.-CARBON FLM 1/16W 100-JB
R01F	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R069	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R01G	0700027M	RES.-CARBON FLM 1/16W 100-JB	R070	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R01H	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R070	0700027M	RES.-CARBON FLM 1/16W 100-JB
R01J	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R071	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R01K	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R071	0700027M	RES.-CARBON FLM 1/16W 100-JB
R01L	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R072	0700058M	RES.-CARBON FLM 1/16W 22K-JB
R01M	0700032M	RES.-CARBON FLM 1/16W 220-JB	R072	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R01N	0700032M	RES.-CARBON FLM 1/16W 220-JB	R073	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R01P	0700032M	RES.-CARBON FLM 1/16W 220-JB	R075	0700067M	RES.-CARBON FLM 1/16W 100K-JB
R01Q	0700048M	RES.-CARBON FLM 1/16W 3.9K-JB	R075	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R01R	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB	R076	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R021	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R077	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R022	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R078	0700058M	RES.-CARBON FLM 1/16W 22K-JB
R023	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R079	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R024	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	R07A	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R025	0700055M	RES.-CARBON FLM 1/16W 12K-JB	R07C	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R026	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R080	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R027	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R084	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R029	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R08C	0700032M	RES.-CARBON FLM 1/16W 220-JB
R02A	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R08D	0100055M	RES.-CARBON FLM 1/8W 390-JB
R030	0700027M	RES.-CARBON FLM 1/16W 100-JB	R08E	0100041M	RES.-CARBON FLM 1/8W 100-JB
R031	0700027M	RES.-CARBON FLM 1/16W 100-JB	R090	0100121M	RES.-CARBON FLM 1/8W 220K-JB
R032	0700056M	RES.-CARBON FLM 1/16W 15K-JB	R091	0700055M	RES.-CARBON FLM 1/16W 12K-JB
R033	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R092	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R034	0700036M	RES.-CARBON FLM 1/16W 470-JB	R096	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R035	0100129M	RES.-CARBON FLM 1/8W 470K-JB	R097	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R036	0100131M	RES.-CARBON FLM 1/8W 560K-JB	R099	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB












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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R099A	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R45F	0100133M	RES.-CARBON FLM 1/8W 680K-JB
R100	0700058M	RES.-CARBON FLM 1/16W 22K-JB	R461	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB
R103	0114131M	RES.-CARBON FLM 1/4W 100-JB	R462	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R206	0700036M	RES.-CARBON FLM 1/16W 470-JB	R463	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R207	0700036M	RES.-CARBON FLM 1/16W 470-JB	R466	0700032M	RES.-CARBON FLM 1/16W 220-JB
R208	0700027M	RES.-CARBON FLM 1/16W 100-JB	R467	0700032M	RES.-CARBON FLM 1/16W 220-JB
R209	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	△ R468	0119505S	RES.-MTL FLM 1/4W 2.2-J
R210	0100121M	RES.-CARBON FLM 1/8W 220K-JB	R472	0100113M	RES.-CARBON FLM 1/8W 100K-JB
R212	0100131M	RES.-CARBON FLM 1/8W 560K-JB	R473	0100065M	RES.-CARBON FLM 1/8W 1K-JB
R213	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB	R474	0100113M	RES.-CARBON FLM 1/8W 100K-JB
R240	0700036M	RES.-CARBON FLM 1/16W 470-JB	R475	0100065M	RES.-CARBON FLM 1/8W 1K-JB
R241	0700027M	RES.-CARBON FLM 1/16W 100-JB	R476	0100065M	RES.-CARBON FLM 1/8W 1K-JB
R242	0700037M	RES.-CARBON FLM 1/16W 560-JB	R477	0100113M	RES.-CARBON FLM 1/8W 100K-JB
R243	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB	R478	0100065M	RES.-CARBON FLM 1/8W 1K-JB
R244	0700033M	RES.-CARBON FLM 1/16W 270-JB	R479	0100113M	RES.-CARBON FLM 1/8W 100K-JB
R246	0100057M	RES.-CARBON FLM 1/8W 470-JB	△ R480	0119505S	RES.-MTL FLM 1/4W 2.2-J
R247	0100057M	RES.-CARBON FLM 1/8W 470-JB	R482	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R248	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R483	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R271	0700058M	RES.-CARBON FLM 1/16W 22K-JB	R485	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R272	0700058M	RES.-CARBON FLM 1/16W 22K-JB	R486	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R301	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R488	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R302	0700058M	RES.-CARBON FLM 1/16W 22K-JB	R489	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R303	0700031M	RES.-CARBON FLM 1/16W 180-JB	R48A	0700027M	RES.-CARBON FLM 1/16W 100-JB
R305	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R48C	0700027M	RES.-CARBON FLM 1/16W 100-JB
R306	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB	R48E	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R307	0700048M	RES.-CARBON FLM 1/16W 3.9K-JB	R48F	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R332	0100041M	RES.-CARBON FLM 1/8W 100-JB	R490	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R333	0100038M	RES.-CARBON FLM 1/8W 75-JB	R491	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R381	0700032M	RES.-CARBON FLM 1/16W 220-JB	R492	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R382	0114141M	RES.-CARBON FLM 1/4W 270-JB	R493	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R383	0100041M	RES.-CARBON FLM 1/8W 100-JB	R495	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R384	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R496	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R3Y1	0100038M	RES.-CARBON FLM 1/8W 75-JB	R4XX	0700034M	RES.-CARBON FLM 1/16W 330-JB
R3Y2	0100041M	RES.-CARBON FLM 1/8W 100-JB	R501	0700063M	RES.-CARBON FLM 1/16W 47K-JB
R402	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R502	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R405	0700033M	RES.-CARBON FLM 1/16W 270-JB	R503	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R406	0700033M	RES.-CARBON FLM 1/16W 270-JB	R504	0700027M	RES.-CARBON FLM 1/16W 100-JB
R407	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	R505	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB
R408	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	R506	0114141M	RES.-CARBON FLM 1/4W 270-JB
R410	0100065M	RES.-CARBON FLM 1/8W 1K-JB	R507	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
R411	0100065M	RES.-CARBON FLM 1/8W 1K-JB	R508	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
R413	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB	R509	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
R414	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R516	0700066M	RES.-CARBON FLM 1/16W 82K-JB
R415	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R525	0700044M	RES.-CARBON FLM 1/16W 1.8K-JB
R416	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R526	0700044M	RES.-CARBON FLM 1/16W 1.8K-JB
R417	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R527	0700044M	RES.-CARBON FLM 1/16W 1.8K-JB
R419	0100051M	RES.-CARBON FLM 1/8W 270-JB	R553	0700038M	RES.-CARBON FLM 1/16W 680-JB
R440	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	R554	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R441	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	R555	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R447	0700065M	RES.-CARBON FLM 1/16W 68K-JB	R556	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R448	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R557	0700027M	RES.-CARBON FLM 1/16W 100-JB
R449	0187076M	RES.-CARBON FLM 1/16W 3.0K-JB	R558	0700027M	RES.-CARBON FLM 1/16W 100-JB
R450	0187082M	RES.-CARBON FLM 1/16W 5.1K-JB	R559	0700044M	RES.-CARBON FLM 1/16W 1.8K-JB
R451	0119636M	RES.-MTL FLM 1/8W 16K-FB	R560	0700044M	RES.-CARBON FLM 1/16W 1.8K-JB
R452	0700036M	RES.-CARBON FLM 1/16W 470-JB	R561	0700044M	RES.-CARBON FLM 1/16W 1.8K-JB
R453	0700036M	RES.-CARBON FLM 1/16W 470-JB	R563	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R454	0700037M	RES.-CARBON FLM 1/16W 560-JB	R564	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB
R457	0700027M	RES.-CARBON FLM 1/16W 100-JB	R565	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB
R458	0700027M	RES.-CARBON FLM 1/16W 100-JB	R566	0700034M	RES.-CARBON FLM 1/16W 330-JB
R459	0100121M	RES.-CARBON FLM 1/8W 220K-JB	R567	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB













REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R568	0700053M	RES.-CARBON FLM 1/16W 8.2K-JB	R672	0110219S	RES.-MTL OXIDE FLM 82-JS
R569	0700027M	RES.-CARBON FLM 1/16W 100-JB	R69W	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB
R570	0700036M	RES.-CARBON FLM 1/16W 470-JB	R701	0100111M	RES.-CARBON FLM 1/8W 82K-JB
R571	0700027M	RES.-CARBON FLM 1/16W 100-JB	R701A	0100109M	RES.-CARBON FLM 1/8W 68K-JB
R572	0100065M	RES.-CARBON FLM 1/8W 1K-JB	R702	0100041M	RES.-CARBON FLM 1/8W 100-JB
R573	0100065M	RES.-CARBON FLM 1/8W 1K-JB	 R706	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB
R574	0100065M	RES.-CARBON FLM 1/8W 1K-JB	 R707	0100097M	RES.-CARBON FLM 1/8W 22K-JB
R591	0700032M	RES.-CARBON FLM 1/16W 220-JB	R70A	0110225S	RES.MTL OXIDE FLM 150-JS 2W
R592	0700032M	RES.-CARBON FLM 1/16W 220-JB	R70C	0110225S	RES.MTL OXIDE FLM 150-JS 2W
R593	0700032M	RES.-CARBON FLM 1/16W 220-JB	R710	0114143M	RES.-CARBON FLM 1/4W 330-JB
R595	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R711	0100065M	RES.-CARBON FLM 1/8W 1K-JB
R59A	0100049M	RES.-CARBON FLM 1/8W 220-JB	 R712	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R5C1	0100038M	RES.-CARBON FLM 1/8W 75-JB	 R713	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB
R5C2	0100041M	RES.-CARBON FLM 1/8W 100-JB	R719	0113750M	RES.-CARBON FLM 1/2W 1K-JB
R5J8	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	R721	AT00334S	RES.MTL OXIDE FLM 3W 120 OHM
R5J9	0700061M	RES.-CARBON FLM 1/16W 33K-JB	R724	0147774	RES.WW 10W 470 OHM CEMENTED
R5L2	0700027M	RES.-CARBON FLM 1/16W 100-JB	R726	0100077M	RES.-CARBON FLM 1/8W 3.3K-JB
R5L3	0700024M	RES.-CARBON FLM 1/16W 56-J	R728	0113758M	RES.-CARBON FLM 1/2W 2.2K-JB
R5L4	0700027M	RES.-CARBON FLM 1/16W 100-JB	R72H	0100025M	RES.-CARBON FLM 1/8W 22-JB
R5L5	0700024M	RES.-CARBON FLM 1/16W 56-J	R734	0100089M	RES.-CARBON FLM 1/8W 10K-JB
R5L6	0700027M	RES.-CARBON FLM 1/16W 100-JB	R735	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB
R5L7	0700024M	RES.-CARBON FLM 1/16W 56-J	R736	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
R5L8	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R73H	0114131M	RES.-CARBON FLM 1/4W 100-JB
R5L9	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R741	0110245S	RES.-MTL OXIDE FLM 1.0K-JS
R5M1	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R742	0114145M	RES.-CARBON FILM SRD 1/4 P 390-J
R5M3	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R743	0113727M	RES. CARBON FILM SRD1/2P-B 120-J
R5N1	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB	R744	0100063M	RES.-CARBON FLM 1/8W 820-JB
R601	0700055M	RES.-CARBON FLM 1/16W 12K-JB	 R745	0100037M	RES.-CARBON FLM 1/8W 68-JB
R605	0700067M	RES.-CARBON FLM 1/16W 100K-JB	R746	0110263S	RES.-MTL OXIDE FLM 5.6K-JS
R609	0119732M	RES.-METAL OXIDE FILM 1.2-JB	 R74A	AT00425S	RES.MTL OXIDE FLM 2W 0.33 OHM
R60E	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	 R74C	AT00425S	RES.MTL OXIDE FLM 2W 0.33 OHM
R611	0700055M	RES.-CARBON FLM 1/16W 12K-JB	R74D	0119691M	RES.-MTL FLM 1W 0.33JB
R612	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	 R74E	AT00425S	RES.MTL OXIDE FLM 2W 0.33 OHM
R613A	0700034M	RES.-CARBON FLM 1/16W 330-JB	 R74F	AT00425S	RES.MTL OXIDE FLM 2W 0.33 OHM
R614	0700061M	RES.-CARBON FLM 1/16W 33K-JB	R74G	0119691M	RES.-MTL FLM 1W 0.33JB
R616	0700054M	RES.-CARBON FLM 1/16W 10K-JB	R74H	0119691M	RES.-MTL FLM 1W 0.33JB
R618	0700059M	RES.-CARBON FLM 1/16W 27K-JB	R74J	0119691M	RES.-MTL FLM 1W 0.33JB
R61E	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	R751	0700034M	RES.-CARBON FLM 1/16W 330-JB
R61W	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB	R751A	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R626	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB	R751B	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
R627	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB	R752	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
R628	0187088M	RES.-CARBON FLM 1/16W 9.1K-JB	R752A	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R629	0700058M	RES.-CARBON FLM 1/16W 22K-JB	R752B	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R62E	0700057M	RES.-CARBON FLM 1/16W 18K-JB	R753	0700034M	RES.-CARBON FLM 1/16W 330-JB
R62W	0700058M	RES.-CARBON FLM 1/16W 22K-JB	R753A	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R630	0700053M	RES.-CARBON FLM 1/16W 8.2K-JB	R753B	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R631	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB	R756	0700031M	RES.-CARBON FLM 1/16W 180-JB
R632	0700048M	RES.-CARBON FLM 1/16W 3.9K-JB	R757	0100029M	RES.-CARBON FLM 1/8W 33-JB
R633	0700057M	RES.-CARBON FLM 1/16W 18K-JB	R757A	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R634	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB	R757B	0700054M	RES.-CARBON FLM 1/16W 10K-JB
R635	0114177M	RES.-CARBON FILM SRD 1/4 P 4.7K-J	R762	0100051M	RES.-CARBON FLM 1/8W 270-JB
R636	0100075M	RES.-CARBON FLM 1/8W 2.7K-JB	R763	0100025M	RES.-CARBON FLM 1/8W 22-JB
R637	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB	R764	0100075M	RES.-CARBON FLM 1/8W 2.7K-JB
R63E	0700057M	RES.-CARBON FLM 1/16W 18K-JB	R765	0100077M	RES.-CARBON FLM 1/8W 3.3K-JB
 R642	 2340371	THERMISTOR 112301-9	R767	0100025M	RES.-CARBON FLM 1/8W 22-JB
R64E	0700066M	RES.-CARBON FLM 1/16W 82K-JB	R768	0700058M	RES.-CARBON FLM 1/16W 22K-JB
R651	0700027M	RES.-CARBON FLM 1/16W 100-JB	R769	0700061M	RES.-CARBON FLM 1/16W 33K-JB
R652	0113733M	RES. CARBON FILM SRD1/2P-B 220-J	R771	0114131M	RES.-CARBON FLM 1/4W 100-JB
R65E	0700057M	RES.-CARBON FLM 1/16W 18K-JB	R772	0100113M	RES.-CARBON FLM 1/8W 100K-JB
R671	0110219S	RES.-MTL OXIDE FLM 82-JS	R773	0114219M	RES.-CARBON FLM 1/4W 56K-JB

REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
	R774 0700054M	RES.-CARBON FLM 1/16W 10K-JB		R879 0100055M	RES.-CARBON FLM 1/8W 390-JB
	R774 0100113M	RES.-CARBON FLM 1/8W 100K-JB		R880 0100055M	RES.-CARBON FLM 1/8W 390-JB
	R775 0100105M	RES.-CARBON FLM 1/8W 47K-JB		R886 0700038M	RES.-CARBON FLM 1/16W 680-JB
	R776 0700059M	RES.-CARBON FLM 1/16W 27K-JB		R889 0114131M	RES.-CARBON FLM 1/4W 100-JB
	R777 0700044M	RES.-CARBON FLM 1/16W 1.8K-JB		R890 0114131M	RES.-CARBON FLM 1/4W 100-JB
	R778 0700049M	RES.-CARBON FLM 1/16W 4.7K-JB		R891 0114131M	RES.-CARBON FLM 1/4W 100-JB
	R779 0700044M	RES.-CARBON FLM 1/16W 1.8K-JB		R892 0700021M	RES.-CARBON FLM 1/16W 33-J
	R780 0700063M	RES.-CARBON FLM 1/16W 47K-JB		R901 0144151	RES.-WIRE WOUND 33-J
	R781 0700047M	RES.-CARBON FLM 1/16W 3.3K-JB		R902 2341261	THERMISTOR
	R782 0700046M	RES.-CARBON FLM 1/16W 2.7K-JB		R905A 0113774M	RES. CARBON FILM SRD1/2P-B 10K-J
	R783 0700054M	RES.-CARBON FLM 1/16W 10K-JB		R905B 0113774M	RES. CARBON FILM SRD1/2P-B 10K-J
	R783 0113729M	RES.-CARBON FLM 1/2W 150-JB		R906 0147811	RES. -WIRE WOUND 15W 1.5-KM
	R784 0700058M	RES.-CARBON FLM 1/16W 22K-JB		R907 0700054M	RES.-CARBON FLM 1/16W 10K-JB
	R784 0113729M	RES.-CARBON FLM 1/2W 150-JB		R910 0114041M	RES.-CARBON FILM SRD 1/4P 10J
	R785 0100041M	RES.-CARBON FLM 1/8W 100-JB		R916A 0119688M	RES.-MTL FLM 1W 0.22-JB
	R785 0100053M	RES.-CARBON FLM 1/8W 330-JB		R916B 0119688M	RES.-MTL FLM 1W 0.22-JB
	R786 0100073M	RES.-CARBON FLM 1/8W 2.2K-JB		R924 0114179M	RES.-CARBON FILM SRD 1/4 PF 5.6K-J
	R786 0100061M	RES.-CARBON FLM 1/8W 680-JB		R925 0114165M	RES.-CARBON FILM SRD 1/4 PF 1.5K-J
	R787 0100073M	RES.-CARBON FLM 1/8W 2.2K-JB		R926 0114165M	RES.-CARBON FILM SRD 1/4 PF 1.5K-J
	R787 AT00958F	RES.MTL OXIDE FLM 7W 120 OHM		R927 0114173M	RES.-CARBON FILM SRD1/4PB 3300-J
	R788 AT00958F	RES.MTL OXIDE FLM 7W 120 OHM		R928 0700038M	RES.-CARBON FLM 1/16W 680-JB
	R789 AT00961F	RES.MTL OXIDE FLM 7W 180 OHM		R929 0100041M	RES.-CARBON FLM 1/8W 100-JB
	R78A 0700054M	RES.-CARBON FLM 1/16W 10K-JB		R930 0100113M	RES.-CARBON FLM 1/8W 100K-JB
	R791 AW00096	TRIMMER RES.		R931 0119688M	RES.-MTL FLM 1W 0.22-JB
	R793 0113750M	RES.-CARBON FLM 1/2W 1K-JB		R932 0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
	R794 0113768M	RES.-CARBON FLM SRD1/2P-B		R933 0700046M	RES.-CARBON FLM 1/16W 2.7K-JB
	R7NQ 0700047M	RES.-CARBON FLM 1/16W 3.3K-JB		R939 0110225S	RES.MTL OXIDE FLM 150-JS 2W
	R7S1 0700054M	RES.-CARBON FLM 1/16W 10K-JB		R945 0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
	R7S2 0700063M	RES.-CARBON FLM 1/16W 47K-JB		R946 0100091M	RES.-CARBON FLM 1/8W 12K-JB
	R7S3 0114153M	RES.-CARBON FILM 1/4W 820-JB		R947 0700027M	RES.-CARBON FLM 1/16W 100-JB
	R801 0100053M	RES.-CARBON FLM 1/8W 330-JB		R948 0119695M	RES.-MTL OXIDE FLM 1W 0.47-F
	R805 0700009M	RES.-CARBON FLM 1/16W 4.7-J		R949 0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
	R806 0700021M	RES.-CARBON FLM 1/16W 33-J		R94A 0114219M	RES.-CARBON FLM 1/4W 56K-JB
	R807 0700016M	RES.-CARBON FLM 1/16W 15-J		R94C 0114209M	RES.-CARBON FILM SRD 1/4 PF 22K-J
	R821 0114175M	RES.-CARBON FILM SRD 1/4 P 3.9K-J		R950 0110279S	RES.-MTL OXIDE FLM 27K-JS
	R822 0114175M	RES.-CARBON FILM SRD 1/4 P 3.9K-J		R951 0110279S	RES.-MTL OXIDE FLM 27K-JS
	R823 0114175M	RES.-CARBON FILM SRD 1/4 P 3.9K-J		R952 0119690M	RES.-METAL FILM 0.27-JB
	R851 0140932S	RSL-392J7WS(BSR-Z)		R954 0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
	R852 0140932S	RSL-392J7WS(BSR-Z)		R958 0100065M	RES.-CARBON FLM 1/8W 1K-JB
	R853 0140932S	RSL-392J7WS(BSR-Z)		R959 0700064M	RES.-CARBON FLM 1/16W 56K-JB
	R854 0113744M	RES. CARBON FILM SRD1/2P-B 560-J		R962 0700046M	RES.-CARBON FLM 1/16W 2.7K-JB
	R855 0113744M	RES. CARBON FILM SRD1/2P-B 560-J		R963 0700059M	RES.-CARBON FLM 1/16W 27K-JB
	R856 0113744M	RES. CARBON FILM SRD1/2P-B 560-J		R976 0700054M	RES.-CARBON FLM 1/16W 10K-JB
	R857 0100053M	RES.-CARBON FLM 1/8W 330-JB		R977 0700027M	RES.-CARBON FLM 1/16W 100-JB
	R858 0100053M	RES.-CARBON FLM 1/8W 330-JB		R978 0700027M	RES.-CARBON FLM 1/16W 100-JB
	R860 0150108	RES.-VARIABLE RV6 100-B		R979 0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
	R861 0700019M	RES.-CARBON FLM 1/16W 27-J		R982 0700045M	RES.-CARBON FLM 1/16W 2.2K-JB
	R863 0700022M	RES.-CARBON FLM 1/16W 39-J		R984 0100071M	RES.-CARBON FLM 1/8W 1.8K-JB
	R864 0150108	RES.-VARIABLE RV6 100-B		RA18 0700057M	RES.-CARBON FLM 1/16W 18K-JB
	R865 0700019M	RES.-CARBON FLM 1/16W 27-J		RA19 0700055M	RES.-CARBON FLM 1/16W 12K-JB
	R866 AW00074	TRIMMER RES.		RA20 0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
	R867 0700031M	RES.-CARBON FLM 1/16W 180-JB		RA21 0700042M	RES.-CARBON FLM 1/16W 1.2K-JB
	R868 AW00074	TRIMMER RES.		RA22 0700039M	RES.-CARBON FLM 1/16W 820-JB
	R869 0700031M	RES.-CARBON FLM 1/16W 180-JB		RA24 0700057M	RES.-CARBON FLM 1/16W 18K-JB
	R870 AW00074	TRIMMER RES.		RA25 0700055M	RES.-CARBON FLM 1/16W 12K-JB
	R871 0700031M	RES.-CARBON FLM 1/16W 180-JB		RA26 0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
	R875 0100049M	RES.-CARBON FLM 1/8W 220-JB		RA27 0700042M	RES.-CARBON FLM 1/16W 1.2K-JB
	R876 0100049M	RES.-CARBON FLM 1/8W 220-JB		RA28 0700039M	RES.-CARBON FLM 1/16W 820-JB
	R877 0100049M	RES.-CARBON FLM 1/8W 220-JB		RA41 0100041M	RES.-CARBON FLM 1/8W 100-JB
	R878 0100055M	RES.-CARBON FLM 1/8W 390-JB		RA42 0100041M	RES.-CARBON FLM 1/8W 100-JB


REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
RK109	0700061M	RES.-CARBON FLM 1/16W 33K-JB	RN75	0100121M	RES.-CARBON FLM 1/8W 220K-JB
RK187	0100065M	RES.-CARBON FLM 1/8W 1K-JB	RN77	0700066M	RES.-CARBON FLM 1/16W 82K-JB
RK276	0700061M	RES.-CARBON FLM 1/16W 33K-JB	RN78	0700063M	RES.-CARBON FLM 1/16W 47K-JB
Δ RK328	0119505S	RES.-MTL FLM 1/4W 2.2-J	RN79	0700063M	RES.-CARBON FLM 1/16W 47K-JB
RL857	0100031M	RES.-CARBON FLM 1/8W 39-JB	RN7A	AW00106	TRIMMER RES.
RL858	0100031M	RES.-CARBON FLM 1/8W 39-JB	RN7C	0700054M	RES.-CARBON FLM 1/16W 10K-JB
RL859	0100031M	RES.-CARBON FLM 1/8W 39-JB	RN7E	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
RMS1	0100041M	RES.-CARBON FLM 1/8W 100-JB	RN7F	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB
RMS2	0100041M	RES.-CARBON FLM 1/8W 100-JB	RN7G	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB
RN09	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	RN7H	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB
RN10	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RN7J	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB
RN13	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RN7K	0700062M	RES.-CARBON FLM 1/16W 39K-JB
RN17	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RN7L	0700054M	RES.-CARBON FLM 1/16W 10K-JB
RN18	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RN7R	0100035M	RES.-CARBON FLM 1/8W 56-JB
RN21	0700036M	RES.-CARBON FLM 1/16W 470-JB	RN7S	0700053M	RES.-CARBON FLM 1/16W 8.2K-JB
RN22	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	RN7T	0700052M	RES.-CARBON FLM 1/16W 6.8K-JB
RN23	0700027M	RES.-CARBON FLM 1/16W 100-JB	RN7W	0700054M	RES.-CARBON FLM 1/16W 10K-JB
RN24	0700027M	RES.-CARBON FLM 1/16W 100-JB	RN7X	0700054M	RES.-CARBON FLM 1/16W 10K-JB
RN25	0700027M	RES.-CARBON FLM 1/16W 100-JB	RN80	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB
RN26	0700027M	RES.-CARBON FLM 1/16W 100-JB	Δ RN87	AW00103	TRIMMER RES.
RN27	0700057M	RES.-CARBON FLM 1/16W 18K-JB	RN88A	0700055M	RES.-CARBON FLM 1/16W 12K-JB
RN28	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	RN88C	0700044M	RES.-CARBON FLM 1/16W 1.8K-JB
RN29	0700057M	RES.-CARBON FLM 1/16W 18K-JB	RN8C	0700056M	RES.-CARBON FLM 1/16W 15K-JB
RN30	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	RN8D	0700062M	RES.-CARBON FLM 1/16W 39K-JB
RN35	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	RN8E	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB
RN36	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	RN8F	0700063M	RES.-CARBON FLM 1/16W 47K-JB
RN37	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB	RN8G	0700048M	RES.-CARBON FLM 1/16W 3.9K-JB
RN38	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB	RN8H	0700027M	RES.-CARBON FLM 1/16W 100-JB
RN40	0700027M	RES.-CARBON FLM 1/16W 100-JB	RN92	0100051M	RES.-CARBON FLM 1/8W 270-JB
RN41	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	RN93	0100041M	RES.-CARBON FLM 1/8W 100-JB
RN42	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	RP01	0700059M	RES.-CARBON FLM 1/16W 27K-JB
RN43	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RP02	0700056M	RES.-CARBON FLM 1/16W 15K-JB
RN44	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RP03	0700059M	RES.-CARBON FLM 1/16W 27K-JB
RN45	0119635M	RES.-MTL FLM 1/8W 15K-FB	RP04	0700056M	RES.-CARBON FLM 1/16W 15K-JB
RN45A	0119635M	RES.-MTL FLM 1/8W 15K-FB	RP05	0700059M	RES.-CARBON FLM 1/16W 27K-JB
RN46	0119647M	RES.-MTL FLM 1/8W 47K-FB	RP06	0700056M	RES.-CARBON FLM 1/16W 15K-JB
RN49	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB	RP07	0700052M	RES.-CARBON FLM 1/16W 6.8K-JB
RN4M	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	RP08	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN50	0700057M	RES.-CARBON FLM 1/16W 18K-JB	RP09	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN51	0119645M	RES.-MTL FLM 1/8W 39K-FB	RP13	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN53	0119625M	RES.-MTL FLM 1/8W 5.6K-FB	RP14	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN54	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	RP15	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN61	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RP16	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN62	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RP17	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN64	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RP18	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN65	0100053M	RES.-CARBON FLM 1/8W 330-JB	RP51	0700059M	RES.-CARBON FLM 1/16W 27K-JB
RN66	0100053M	RES.-CARBON FLM 1/8W 330-JB	RP52	0700059M	RES.-CARBON FLM 1/16W 27K-JB
RN6A	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RP53	0700059M	RES.-CARBON FLM 1/16W 27K-JB
RN6C	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RR01	0700063M	RES.-CARBON FLM 1/16W 47K-JB
RN6E	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RR02	0700027M	RES.-CARBON FLM 1/16W 100-JB
RN6G	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RR03	0700038M	RES.-CARBON FLM 1/16W 680-JB
RN6H	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	RR07	0700054M	RES.-CARBON FLM 1/16W 10K-JB
RN6J	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RR08	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RN6M	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RR09	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
RN6N	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB	RR41	0700067M	RES.-CARBON FLM 1/16W 100K-JB
RN70	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RR42	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
RN71	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RR43	0700055M	RES.-CARBON FLM 1/16W 12K-JB
RN72	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RR44	0700066M	RES.-CARBON FLM 1/16W 82K-JB
RN73	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RR45	0700067M	RES.-CARBON FLM 1/16W 100K-JB
RN74	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RR46	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB














REPLACEMENT PARTS LIST

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
RR47	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB	RT45	0100041M	RES.-CARBON FLM 1/8W 100-JB
RR48	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RT46	0100041M	RES.-CARBON FLM 1/8W 100-JB
RR49	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RT49	0100038M	RES.-CARBON FLM 1/8W 75-JB
RR50	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RT50	0100038M	RES.-CARBON FLM 1/8W 75-JB
RR51	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RT51	0100038M	RES.-CARBON FLM 1/8W 75-JB
RR52	0700027M	RES.-CARBON FLM 1/16W 100-JB	RT52	0100061M	RES.-CARBON FLM 1/8W 680-JB
RR53	0700027M	RES.-CARBON FLM 1/16W 100-JB	RT53	0100055M	RES.-CARBON FLM 1/8W 390-JB
RR54	0700027M	RES.-CARBON FLM 1/16W 100-JB	RT54	0100061M	RES.-CARBON FLM 1/8W 680-JB
RR56	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RT55	0100055M	RES.-CARBON FLM 1/8W 390-JB
RR57	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RVC1	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB
RR58	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB	RVC2	0700065M	RES.-CARBON FLM 1/16W 68K-JB
RR59	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RVC3	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB
RR60	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RVC4	0700033M	RES.-CARBON FLM 1/16W 270-JB
RR61	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RVC5	0110223S	RES.-MTL OXIDE FLM 120-JS
RR62	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RVC6	0110225S	RES.MTL OXIDE FLM 150-JS 2W
RR64	0700032M	RES.-CARBON FLM 1/16W 220-JB	RVC7	0113764M	RES. CARBON FILM SRD1/2P-B 3.9K-J
RR65	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RW01	0700067M	RES.-CARBON FLM 1/16W 100K-JB
RR66	0700036M	RES.-CARBON FLM 1/16W 470-JB	RW02	0700059M	RES.-CARBON FLM 1/16W 27K-JB
RR70	0700036M	RES.-CARBON FLM 1/16W 470-JB	RW06	0700034M	RES.-CARBON FLM 1/16W 330-JB
RR71	0700047M	RES.-CARBON FLM 1/16W 3.3K-JB	RW07	0700057M	RES.-CARBON FLM 1/16W 18K-JB
RR72	0700027M	RES.-CARBON FLM 1/16W 100-JB	RW08	0700067M	RES.-CARBON FLM 1/16W 100K-JB
RR73	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	RW09	0700033M	RES.-CARBON FLM 1/16W 270-JB
RR74	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB	RW10	0700033M	RES.-CARBON FLM 1/16W 270-JB
RR75	0700027M	RES.-CARBON FLM 1/16W 100-JB	RW11	0700042M	RES.-CARBON FLM 1/16W 1.2K-JB
RR78	0100041M	RES.-CARBON FLM 1/8W 100-JB	RW12	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB
RR79	0100065M	RES.-CARBON FLM 1/8W 1K-JB	RW13	0700058M	RES.-CARBON FLM 1/16W 22K-JB
RR80	0100041M	RES.-CARBON FLM 1/8W 100-JB	RW16	0113742M	RES.-CARBON FLM 1/2W 470-JB
RS01	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB	RW17	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB
RSA1	0114131M	RES.-CARBON FLM 1/4W 100-JB	RW19	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
RS2	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RW21	0113701M	RES. CARBON FILM SRD1/2P-B 10-J
RSA3	0700063M	RES.-CARBON FLM 1/16W 47K-JB	RW22	0100039M	RES.-CARBON FLM 1/8W 82-JB
RSA4	0700045M	RES.-CARBON FLM 1/16W 2.2K-JB	RW23	0100039M	RES.-CARBON FLM 1/8W 82-JB
RSA5	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB	RW24	0114165M	RES.-CARBON FILM SRD 1/4 PF 1.5K-J
RSA6	0700027M	RES.-CARBON FLM 1/16W 100-JB	RW25	0100069M	RES.-CARBON FLM 1/8W 1.5K-JB
RSA7	0700027M	RES.-CARBON FLM 1/16W 100-JB	RW26	0114143M	RES.-CARBON FLM 1/4W 330-JB
 RSE1	0119505S	RES.-MTL FLM 1/4W 2.2-J	RW27	0114221M	RES.-CARBON FLM 1/4 PB 68K-J
RSE3	0700054M	RES.-CARBON FLM 1/16W 10K-JB	RW28	0114221M	RES.-CARBON FLM 1/4 PB 68K-J
RT01	0100113M	RES.-CARBON FLM 1/8W 100K-JB	RW29	0100053M	RES.-CARBON FLM 1/8W 330-JB
RT02	0100065M	RES.-CARBON FLM 1/8W 1K-JB	RW30	0113776M	RES. CARBON FILM SRD1/2P-B 12K-J
RT03	0100113M	RES.-CARBON FLM 1/8W 100K-JB	RW31	0113716M	RES. CARBON FILM SRD1/2P-B 43-J
RT04	0100065M	RES.-CARBON FLM 1/8W 1K-JB	RW32	0113716M	RES. CARBON FILM SRD1/2P-B 43-J
RT17	0700034M	RES.-CARBON FLM 1/16W 330-JB	RW33	0113686M	RES.-CARBON FLM 1/2W 2.7-J
RT18	0700034M	RES.-CARBON FLM 1/16W 330-JB	RW34	0113686M	RES.-CARBON FLM 1/2W 2.7-J
RT19	0700034M	RES.-CARBON FLM 1/16W 330-JB	RW35	0110229S	RES.-MTL OXIDE FLM 220-JS
RT20	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RW36	0110139S	RES.-MTL OXIDE FLM 1W 560-JS
RT21	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RW37	0110232S	RES.-MTL OXIDE FLM 300-JS
RT22	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RW38	0700049M	RES.-CARBON FLM 1/16W 4.7K-JB
RT23	0700028M	RES.-CARBON FLM 1/16W 120-JB	RW39	0700051M	RES.-CARBON FLM 1/16W 5.6K-JB
RT24	0700028M	RES.-CARBON FLM 1/16W 120-JB	RW40	0700061M	RES.-CARBON FLM 1/16W 33K-JB
RT25	0700028M	RES.-CARBON FLM 1/16W 120-JB	RW41	0700036M	RES.-CARBON FLM 1/16W 470-JB
RT26	0700032M	RES.-CARBON FLM 1/16W 220-JB	RW42	0700067M	RES.-CARBON FLM 1/16W 100K-JB
RT27	0700032M	RES.-CARBON FLM 1/16W 220-JB	RW43	0700056M	RES.-CARBON FLM 1/16W 15K-JB
RT28	0700032M	RES.-CARBON FLM 1/16W 220-JB	RW44	0700043M	RES.-CARBON FLM 1/16W 1.5K-JB
RT29	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RW45	0700067M	RES.-CARBON FLM 1/16W 100K-JB
RT30	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RW47	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
RT31	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB	RW48	0700041M	RES.-CARBON FLM 1/16W 1.0K-JB
RT41	0100041M	RES.-CARBON FLM 1/8W 100-JB	RW49	0700046M	RES.-CARBON FLM 1/16W 2.7K-JB
RT42	0100041M	RES.-CARBON FLM 1/8W 100-JB	RW51	0700033M	RES.-CARBON FLM 1/16W 270-JB
RT43	0100041M	RES.-CARBON FLM 1/8W 100-JB	RW52	0700035M	RES.-CARBON FLM 1/16W 390-JB
RT44	0100041M	RES.-CARBON FLM 1/8W 100-JB	RW53	0700035M	RES.-CARBON FLM 1/16W 390-JB

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
	RW54	0700041M RES.-CARBON FLM 1/16W 1.0K-JB		#203	4519503 3X12 B TAPPING SCREW SWCH15A
	RW55	0700028M RES.-CARBON FLM 1/16W 120-JB		#205	4286582 PVC WASHER T1.5
	RYG1	0700058M RES.-CARBON FLM 1/16W 22K-JB		#210	4159427 3X10 SCREW WITH WASHER STEEL
	RYG2	0700041M RES.-CARBON FLM 1/16W 1.0K-JB		#215	4519512 4X16 B TAPPING SCREW
	RYG7	0700054M RES.-CARBON FLM 1/16W 10K-JB		#220	4520771 HEXAGON HEAD TAPPING SCREW 4*1
	RYG8	0700041M RES.-CARBON FLM 1/16W 1.0K-JB		#251	4520232 4X16 D TAPPING SCREW SWCH16A
	RYG9	0700041M RES.-CARBON FLM 1/16W 1.0K-JB		#300	3163508 COVER 27CX3B
	RYH2	0700041M RES.-CARBON FLM 1/16W 1.0K-JB		#305	4519512 4X16 B TAPPING SCREW
	RYH3	0700058M RES.-CARBON FLM 1/16W 22K-JB		#310	4519512 4X16 B TAPPING SCREW
	RYH4	0700054M RES.-CARBON FLM 1/16W 10K-JB		#315	3727972 POWER CORD HANGER
	RYH5	0700058M RES.-CARBON FLM 1/16W 22K-JB		#900	8440444 SP HIMERON C29-BV20
	RYH6	0700054M RES.-CARBON FLM 1/16W 10K-JB		#906	PH04801 TERMINAL LABEL PA-1
	RYH7	0700054M RES.-CARBON FLM 1/16W 10K-JB		E203	2784243 DRY BATTERY SUM-3 (G)
	RYH8	0700045M RES.-CARBON FLM 1/16W 2.2K-JB		E301	HL00723 RML-CLU-433PC
	RYH9	0700045M RES.-CARBON FLM 1/16W 2.2K-JB		E601	BY00491 DY 27V
	RYJ1	0700049M RES.-CARBON FLM 1/16W 4.7K-JB		E602	2908401 CRT EARTH WIRE
	RYJ2	0700049M RES.-CARBON FLM 1/16W 4.7K-JB		E603	2771461 EDGE MAGNET
	RYJ3	0700067M RES.-CARBON FLM 1/16W 100K-JB		E604	2775082 MAGNET VM
		SWITCHES		E77A	2974562 CONNECTOR 06C-A5R0-681
	S001	2632851 5KEY TACT SWITCH		E802	2976671 CONN. WWIRE SEH 4J (L560)
	S002	2634621 SWITCH BLOCK VR		E851	EY00302 CPT-SOCKET(S)
	S003	2634621 SWITCH BLOCK VR		E87A	2974134S CONNE.EH 5P B-C L=750
	S701	FJ00071 AC POWER RELAY ALK3213		E901	2972841 AC POWER CORD (FILTER IN)
	S702	FJ00071 AC POWER RELAY ALK3213		E902	EF02493 CONNECTOR 01A-A0R0-561BROWN
	S703	FJ00071 AC POWER RELAY ALK3213		E903	EF02494 CONNECTOR 01A-A0R0-561RED
	S901	FJ00071 AC POWER RELAY ALK3213		ECPT	2668151 2J MINI-CONNECTOR
		TRANSFORMERS		EF901	2720641 FUSE HOLDER
	T201	2143672 IF COIL WITH 7 CASE 1:3 INCORE		EF902	2720641 FUSE HOLDER
	T701	2260261 DRIVE TRANSFORMER		EP51	2956485 CONNECTOR CO-01C-A-471
	T702	2437122 HFL1530G-RC		EP70	AZ00103M PROTECTOR
	T771	2272762 TRANS.-SATURBLE		EVM1	2974098S CONN.WWIRE 4J SEH L470 (C-B)
	T901	BT00742 SW TRANS.(PA1)		EX1	2973888S EH CONNE.9P L=470
		CRT		EX2A	2976661 CONN. WWIRE SEH 12J (L300)
	V1	2471561 CRT A68KSA30X (DARK TINT)		EX3	2973918S EH CONNE.10P L=470
		CRYSTALS		J301	ES00142 JACK 7P
	X001	BP00801 OSCILLATOR 8.00MHZ		JMS	EY00581 SOCKET
	X201	2300477 SAW FILTER HW2267		JP51	9371901 SC ANNEALED COPPER WIRE 0.65
	X241	2167311 FILTER CERAMIC (4.5MHZ)		JPC	2902981 15P D-SUB CONNE.
	X242	2167201 TRAP CERAMIC (4.5MHZ)		JS1	2693851 TERMINAL JXT1043
	X243	BN00031 CERAMIC DISCRIMINATOR		JSL	2976647 2J EH CONNECTOR 701
	X301	HP00151 COMB FILTER UNIT TYPE MN138H		JSR	2976656 3J EH CONNECTOR
	X501	2791505 CRYSTAL HC-491U 3.58MHZ		K271	9374575 UL CSA1007-24HP CODE GREEN
	X751	2168771 XTAL CSB503F30		K272	9374575 UL CSA1007-24HP CODE GREEN
	X901	AJ00332 ENC221D-14A		K775	9374722 WIRE UL1015 7/0.26 SN ORANGE
	XT11	BJ00392R LC FILTER 220L7R0SST-ELKAW470GB		K776	9374526 WIRE UL1015 7/0.26 SN YELLOW
	XT12	BJ00392R LC FILTER 220L7R0SST-ELKAW470GB		K801	9374575 UL CSA1007-24HP CODE GREEN
	XT13	BJ00392R LC FILTER 220L7R0SST-ELKAW470GB		K802	9374575 UL CSA1007-24HP CODE GREEN
	XW01	2150361 FILTER SDL4620		K803	9374722 WIRE UL1015 7/0.26 SN ORANGE
	XY03	2163974 VFL-CSA 8.00M		K804	9374575 UL CSA1007-24HP CODE GREEN
		MISCELLANEOUS PARTS		K856	9371901 SC ANNEALED COPPER WIRE 0.65
	#21	3701202 PWB HOLDER G7-A PA		K998	9374575 UL CSA1007-24HP CODE GREEN
	#100	QD00734 FRAME SUBASSEMBLY 27MM20B		K999	9374723 WIRE UL1015 7/0.26 SN BLACK
	#106	NT01041 TERMINAL BOARD PA-1		KC103	9374575 UL CSA1007-24HP CODE GREEN
	#125	PC00343 BUTTON 27CX3B		KIF1	9371901 SC ANNEALED COPPER WIRE 0.65
	#130	8781642 SCREW 4*12 TAPPING		KIF2	9374574 SC WIRE UL1007 CSATR64 AWG24 YELLO
	#135	H310881 R/C LENS 27CX3B		KIP4	9374575 UL CSA1007-24HP CODE GREEN
	#140	8781642 SCREW 4*12 TAPPING		KIP5	9374575 UL CSA1007-24HP CODE GREEN
	#145	3487425 HITACHI BADGE 35UX80B		KIP6	9374575 UL CSA1007-24HP CODE GREEN
	#160	3739671 BS CORD HOLDER NYLON6		KIP7	9374575 UL CSA1007-24HP CODE GREEN
	#200	4528351 M6X30 TAP SCREW WITH WASHER		KIP8	9374575 UL CSA1007-24HP CODE GREEN

REPLACEMENT PARTS LIST

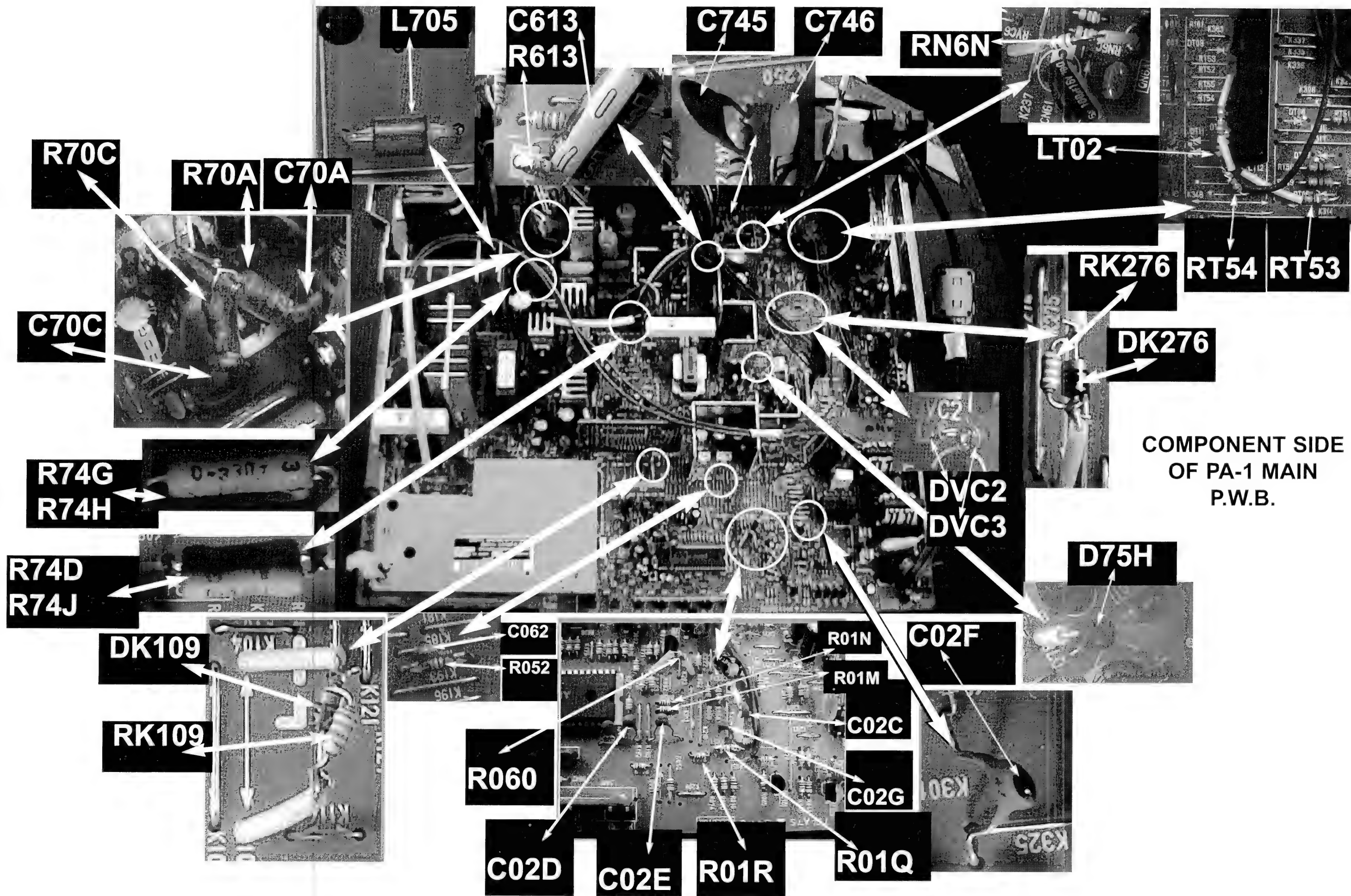
PRODUCT SAFETY NOTICE: Components marked with a  have special characteristics important to safety. Before replacing any of these components, carefully read the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing

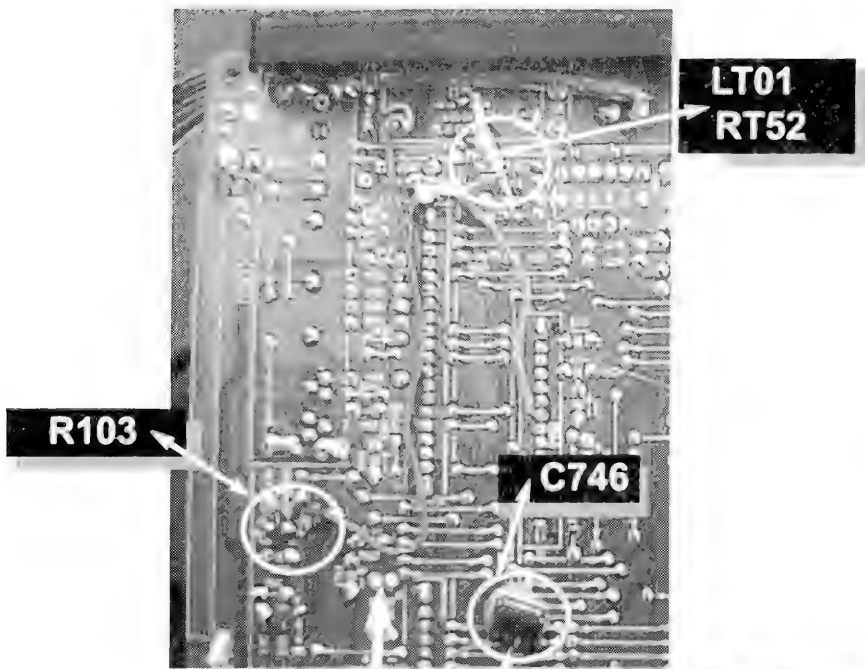
SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
KL103	9371803	NETTED WIRE 4*16/0.12	NI901A	4520883	3*12 SCREW WITH WASHER
KQ584	9374575	UL CSA1007-24HP CODE GREEN	NI901B	8821114	NUT,3
KS01	9374574	SOLDER COATED WIRE UL1007 CSATR64 AW	NJPCA	4527661	M2.6 INCH SCREW
KS02	9374574	SOLDER COATED WIRE UL1007 CSATR64 AW	NMV1	4159423	SCR NO 3X12 FL/FLT
KS03	9374574	SOLDER COATED WIRE UL1007 CSATR64 AW	NMV4	4243445	G51 INSULATION WASHER PL
KS04	9374574	SOLDER COATED WIRE UL1007 CSATR64 AW	NN01	MD03361	SHIELD CASE PA-1
KS05	9374575	UL CSA1007-24HP CODE GREEN	NN02	MD03351	SHIELD PLATE PA-1
KS06	9374575	UL CSA1007-24HP CODE GREEN	NQ701	3445563	HEAT SINK A3LXU
KT01	9374575	UL CSA1007-24HP CODE GREEN	NQ701A	4520881	M3*8 SCREW WITH WASHER
KT03	9374575	UL CSA1007-24HP CODE GREEN	NQ702	3442026	METAL PARTS FOR HOUT(HEAT SINK)
KT04	9374575	UL CSA1007-24HP CODE GREEN	NQ702A	4514061	SCREW FLANGED 3*12
KT05	9374575	UL CSA1007-24HP CODE GREEN	NQ705	MA00891	VERTICAL HEAT SINK
N101	0000000	UNFIXED PART	NQ705A	4520881	M3*8 SCREW WITH WASHER
N101	3785511	V LOCK 16	NQ707	4334013	HEAT SINK
N102	3785522	V LOCK 20	NQ707A	4520881	M3*8 SCREW WITH WASHER
N103	3785502	V LOCK 11.5	NQ72H	4334013	HEAT SINK
N104	3785522	V LOCK 20	NQ72HA	4520881	M3*8 SCREW WITH WASHER
N105	3705232	ANODE CLAMPER	NQ754	4340673	D ID1 HEAT SINK
N106	3785511	V LOCK 16	NQ754A	4520883	3*12 SCREW WITH WASHER
N107	3785522	V LOCK 20	NQ754B	9414017	SILICONE COMPOUND(G-746)
N108	3785511	V LOCK 16	NQ756	MA00891	VERTICAL HEAT SINK
N109	3785522	V LOCK 20	NQ756A	4520881	M3*8 SCREW WITH WASHER
N110	3785502	V LOCK 11.5	NQ774	4276993	VERTICAL HEAT SINK
N111	3785502	V LOCK 11.5	NQ774A	4520883	3*12 SCREW WITH WASHER
N112A	9374506	WIRE UL1007 CSATR64 AWG22 1/0.	NQ775	4340673	D ID1 HEAT SINK
N113	3763751	SK BINDER	NQ851	4340673	D ID1 HEAT SINK
N114	3785502	V LOCK 11.5	NQ851A	4520883	3*12 SCREW WITH WASHER
N115	3737102	PURSE LOCK 15	NQ851B	9414017	SILICONE COMPOUND(G-746)
N116	3785502	V LOCK 11.5	NQ854	4340673	D ID1 HEAT SINK
N130	3700342	WIRE CLAMP V0	NQ854A	4520883	3*12 SCREW WITH WASHER
N202	H311361	LABEL-MOUSE OPERATION	NQ854B	9414017	SILICONE COMPOUND(G-746)
N444	3772201	AC CORD HOLDER NYLON	NQ857	4340673	D ID1 HEAT SINK
N601	4615641	WEDGE	NQ857A	4520883	3*12 SCREW WITH WASHER
N605	0649009	HOOK-30	NQ857B	9414017	SILICONE COMPOUND(G-746)
N606	3330941	EARTH SPRING	NT702	8821114	NUT,3
N607B	3763751	SK BINDER	NT702A	4243445	G51 INSULATION WASHER PL-11T
N608	3763751	SK BINDER	NT702B	8711412	SCREW-3X12 PAN HEAD
N610	2772981	FERRITE SHEET ASS'Y	NWQ1	3446473	HEATSINK H30 P10
N611	2772211	MAG. PIECE	NWQ2	4520883	3*12 SCREW WITH WASHER
N700	H461171	PATENT AND TELESONICS LABEL	NX901	2784342	CONDENSER COVER
N801	MD03371	CPT SHIELD 27MM20B	P31	2661751	2P PLUG PIN WITH BASE
N888	3763751	SK BINDER	P67A	ED00568	CP-TAC-L12X-A1
N910	4107502	PWB METAL R (A1) TC-30	P67B	ED00508	CP-TAC-L12P-A1
N912	4107512	A1LXU1 PWB METAL L TC-30	P77B	2661755	6P PLUG PIN WITH BASE
ND712	MA00951	HEAT SINK PA-1	P801	2902263	PLUG PIN SUB MINI 4P
ND712A	4520883	3*12 SCREW WITH WASHER	P87B	2902264	PLUG PIN SUB MINI 5P
ND714	3446472	HEATSINK	P901	2782611	CENTER PIN
ND714A	4520883	3*12 SCREW WITH WASHER	P902	2782611	CENTER PIN
ND934	3446472	HEATSINK	PAGC	2123461M	FERRITE BEADS B 0.8 MH
ND934A	4520883	3*12 SCREW WITH WASHER	PCPT	2661751	2P PLUG PIN WITH BASE
ND936	3446472	HEATSINK	PFIL	2661756	1P PLUG PIN WITH BASE
ND936A	4520883	3*12 SCREW WITH WASHER	PIF1A	ED00576	CP-TAC-L20X-A1
NE901	3772201	AC CORD HOLDER NYLON	PIF1B	ED00516	CP-TAC-L20P-A1
NI403	3446862	VERTICAL HEAT SINK M1LXU	PIF2A	ED00572	CP-TAC-L15X-A1
NI403A	4520881	M3*8 SCREW WITH WASHER	PIF2B	ED00512	CP-TAC-L15P-A1
NI403B	8821234	NUT-3	PIF3A	ED00572	CP-TAC-L15X-A1
NI601	3446864	V.HEAT SINK M3LXU	PIF3B	ED00512	CP-TAC-L15P-A1
NI601A	4520881	M3*8 SCREW WITH WASHER	PJIG	2661753	4P PLUG PIN WITH BASE
NI601B	8821234	NUT-3	PMH	2661754	5P PLUG PIN WITH BASE
NI901	4289236	G7NSU2 POWER HEAT SINK	PMV	2661752	3P PLUG PIN WITH BASE

REPLACEMENT PARTS LIST

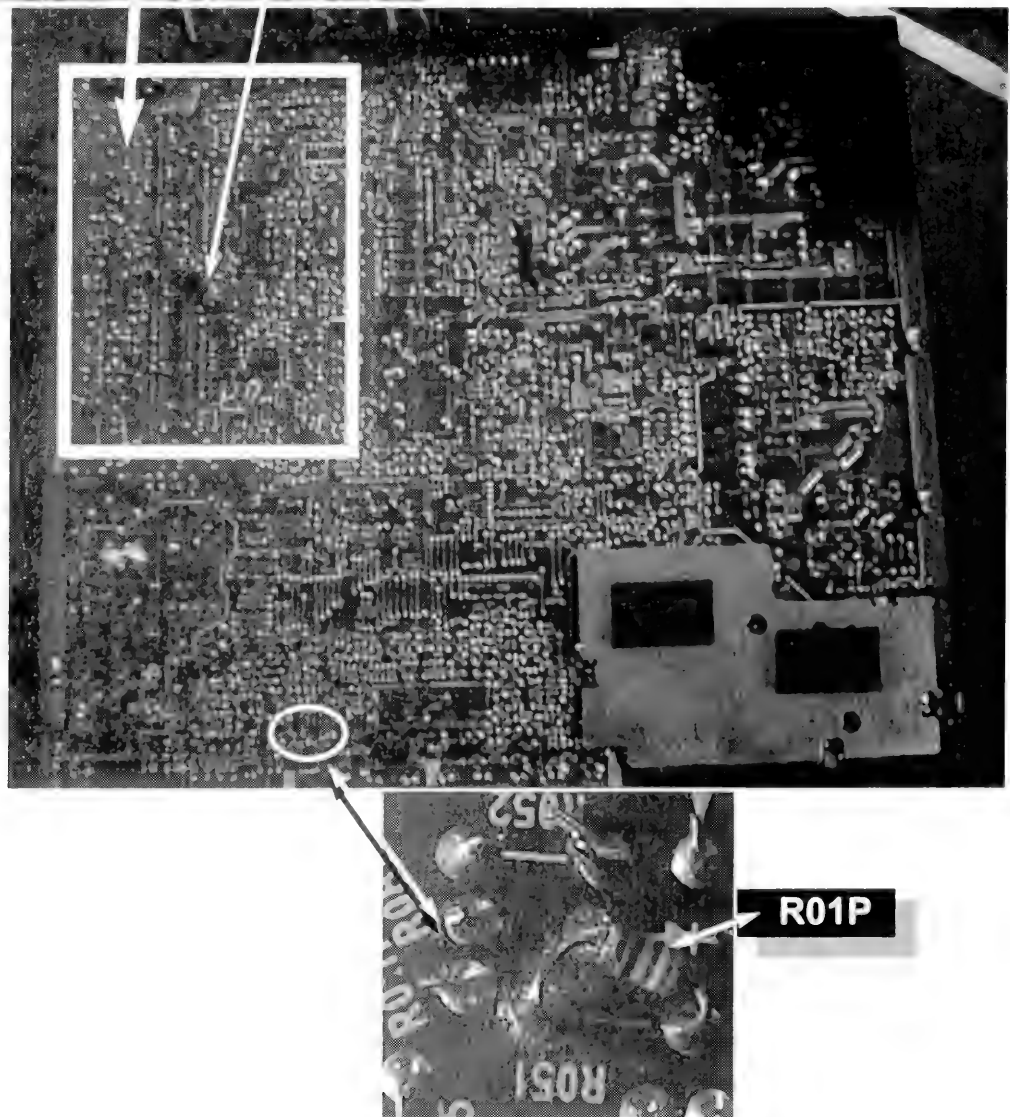
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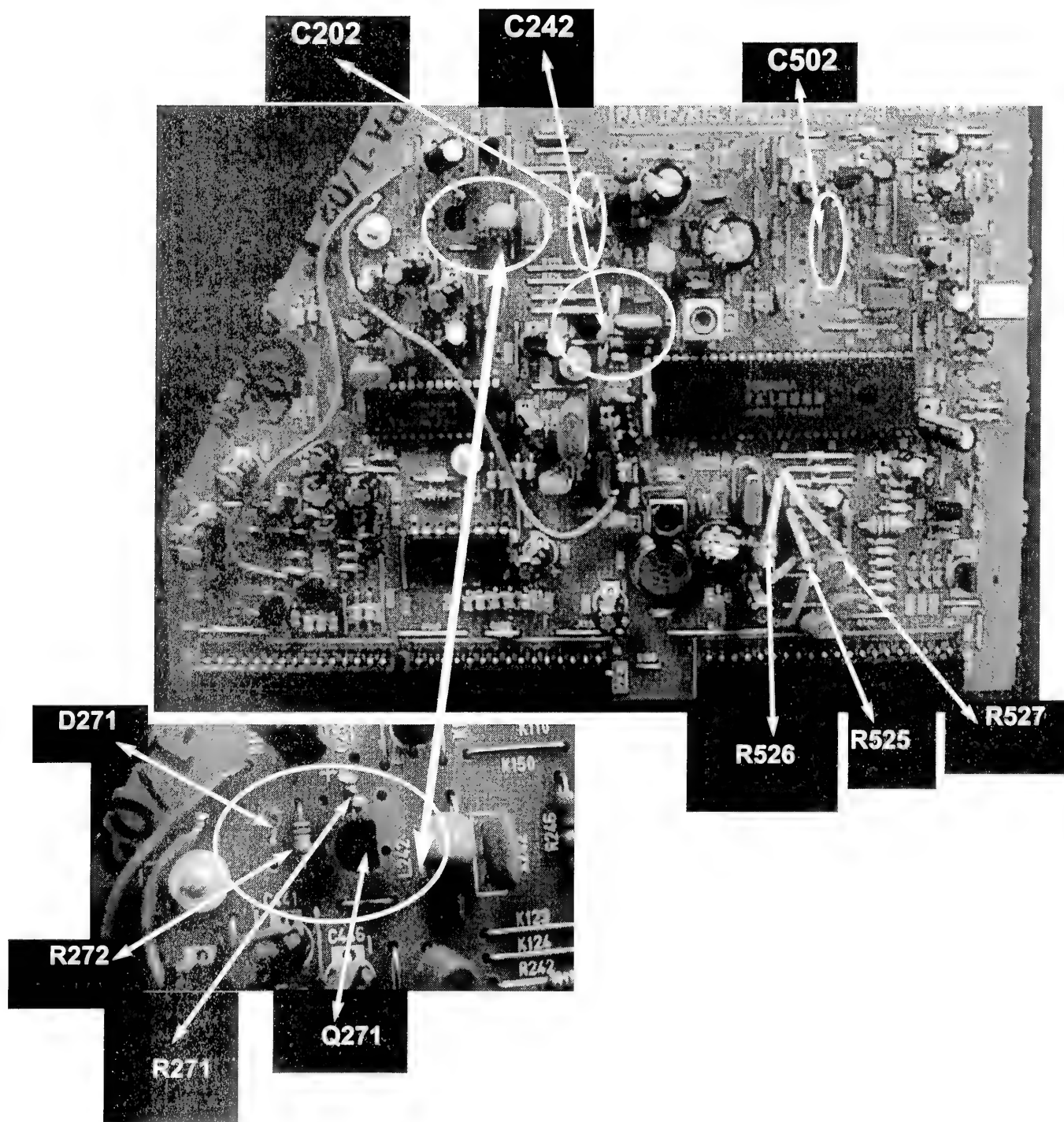
SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
PPCM	ED00564	CP-TAC-L08X-A1	ZK804	9449602	ADHESIVE TAPE(NITTOH NO.747 W6)
PPCMB	ED00504	CP-TAC-L08P-A1	ZK805	9449567	TAPE-ADHESIVE W9 NITTO#223S(B) PVC
PS1A	ED00572	CP-TAC-L15X-A1	ZKL103	9451120	UL-TUBE NO.5 CLEAR
PS1B	ED00512	CP-TAC-L15P-A1	ZKS01	9485158	HOT MELT (AX-1503C)
PS2A	ED00569	CP-TAC-L13X-A1	ZKS02	9485158	HOT MELT (AX-1503C)
PS2B	ED00509	CP-TAC-L13P-A1	ZKS03	9485158	HOT MELT (AX-1503C)
PSIF	2661756	1P PLUG PIN WITH BASE	ZKS05	9413926	SILICON RUBBER
PSL	2902261	PLUGPIN SUB MINI 2P	ZKS06	9413926	SILICON RUBBER
PSR	2902262	PLUG PIN SUB MINI 3P	ZKT05	9485158	HOT MELT (AX-1503C)
PVC0	2661756	1P PLUG PIN WITH BASE	ZQ584	9449603	NITTOH TAPE #747
PVM1	2902263	PLUG PIN SUB MINI 4P	ZQ851	2787213	INSULATOR FOR TRANSISTOR
PVM2	2661756	1P PLUG PIN WITH BASE	ZQ854	2787213	INSULATOR FOR TRANSISTOR
PW	2661753	4P PLUG PIN WITH BASE	ZQ857	2787213	INSULATOR FOR TRANSISTOR
PX1A	2902268	PLUG PIN SUB MINI 9P	ZR525	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
PX1B	2902268	PLUG PIN SUB MINI 9P	ZR526	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
PX2B	2902272	PLUG PIN SUB MINI 12P	ZR527	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
PX3A	2902269	PLUG PIN SUB MINI10P	ZR74G	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
PX3B	2902269	PLUG PIN SUB MINI10P	ZR74J	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
SP451	GK00062	SP-05X09D	ZRN6N	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
SP452	GK00062	SP-05X09D	ZRP02	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
U001	CZ00641	GP1U281Q	ZRP04	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
Δ U101	HJ00081	ET452A	ZRP06	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
Z024	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW	ZRP51	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
Z202	EW03101	CORD 6P MINI DIN CABLE	ZRP52	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
Z203	EW00221	CORD HDB15-HDB15(DDC)2	ZRP53	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
Z403	9414017	SILICONE COMPOUND(G-746)	ZRR41	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
Z510	9449603	NITTOH TAPE #747	ZRT17	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
Z601	9414017	SILICONE COMPOUND(G-746)	ZRT52	9451120	UL-TUBE NO.5 CLEAR
Z702	9414017	SILICONE COMPOUND(G-746)	ZRT53	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW
Z705	9414017	SILICONE COMPOUND(G-746)	ZX901	9449567	TAPE-ADHESIVE W9 NITTO#223S(B) PVC
Z707	9414017	SILICONE COMPOUND(G-746)	Δ EK002	AZ00103M	PROTECTOR
Z70A	9451119	UL-TUBE NO.9/16 INCH CLEAR			
Z712	9414017	SILICONE COMPOUND(G-746)			
Z714	9413926	SILICON RUBBER			
Z722	9413926	SILICON RUBBER			
Z755	9449553	TAPE-ADHESIVE W19 NITTO#223S(B) PVC			
Z756	9414017	SILICONE COMPOUND(G-746)			
Z775	9449503	ADHESIVE TAPE (SCOTCH NO.3 W=9)			
Z901	9414017	SILICONE COMPOUND(G-746)			
Δ Z902	2169512	CLAMP NOISE FILTER ZCAT3035			
Z903	9414017	SILICONE COMPOUND(G-746)			
Z905	9449503	ADHESIVE TAPE (SCOTCH NO.3 W=9)			
Z936	9414017	SILICONE COMPOUND(G-746)			
ZC016	9413926	SILICON RUBBER			
ZC017	9413926	SILICON RUBBER			
ZC02C	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW			
ZC201	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW			
ZC242	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW			
ZC71H	9413926	SILICON RUBBER			
ZC746	9414017	SILICONE COMPOUND(G-746)			
ZCN7L	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW			
ZCP01	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW			
ZD75H	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW			
ZDW1	9451136	UL CSA TUBE NO.8			
ZJ801	9485158	HOT MELT (AX-1503C)			
ZJSL2	9563445	EXCEED GLASS TUBE HG-2E 3.5			
ZJSR2	9563445	EXCEED GLASS TUBE HG-2E 3.5			
ZK109	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW			
ZK276	9451104	VARNISH CLOTH TUBE 0.8X1.8 YELLOW			
ZK803	9563445	EXCEED GLASS TUBE HG-2E 3.5			



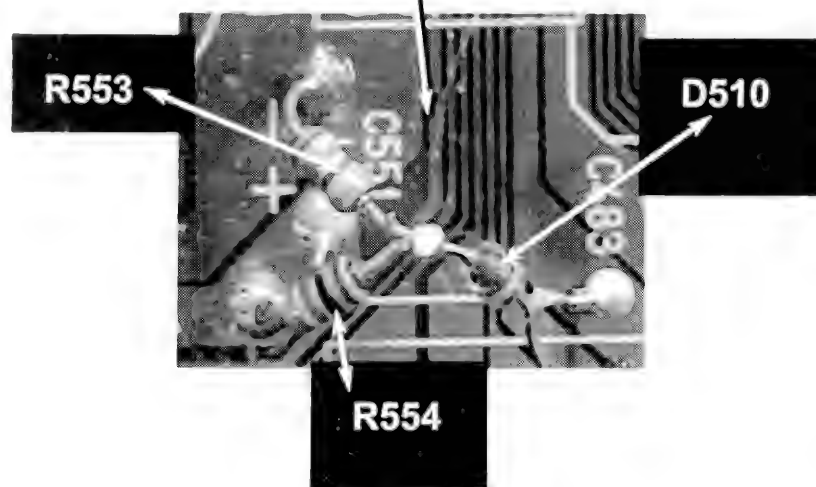


PA1-Pattern
Side of
MAIN BOARD

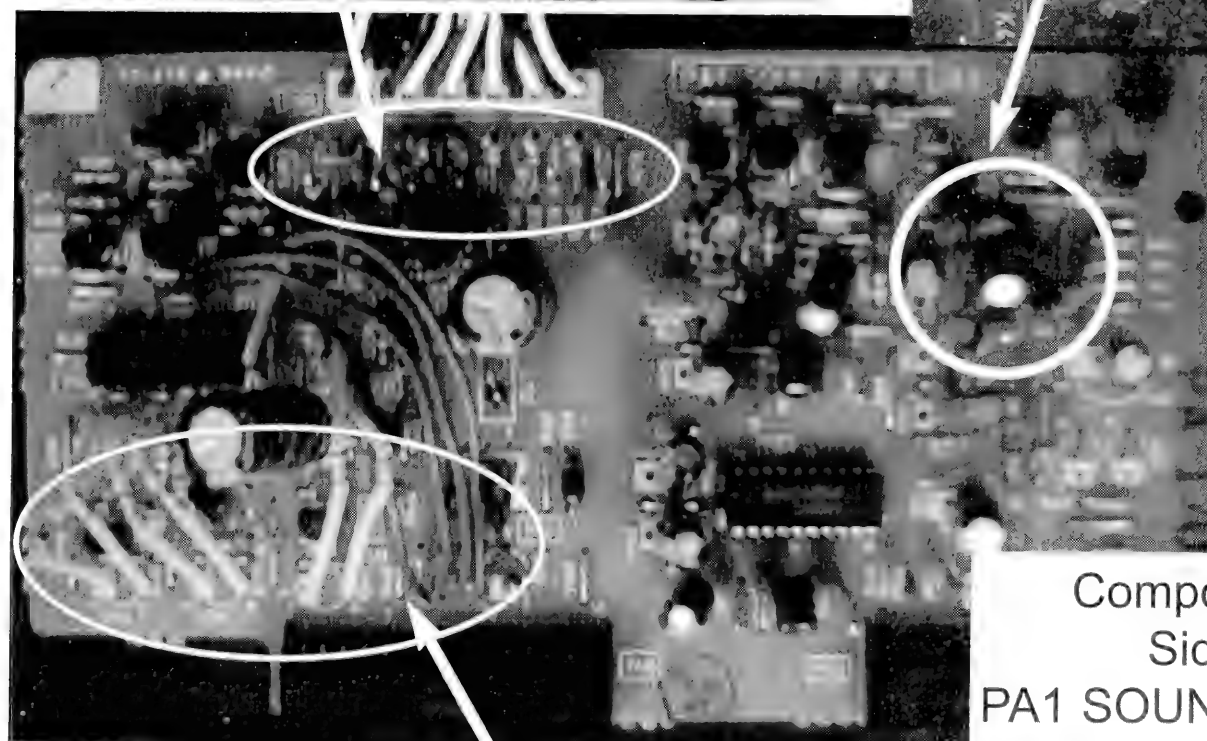
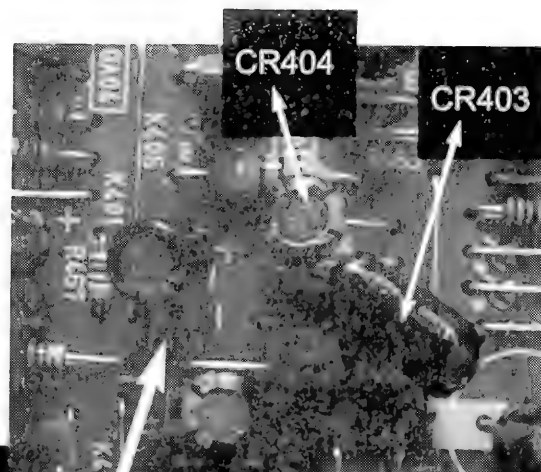
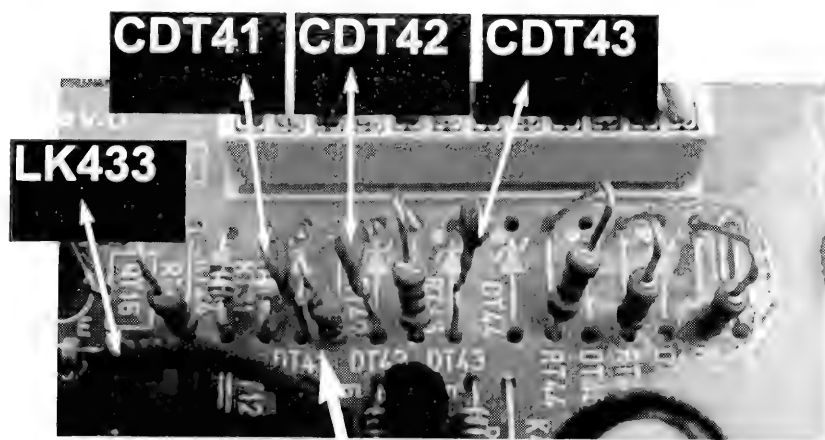




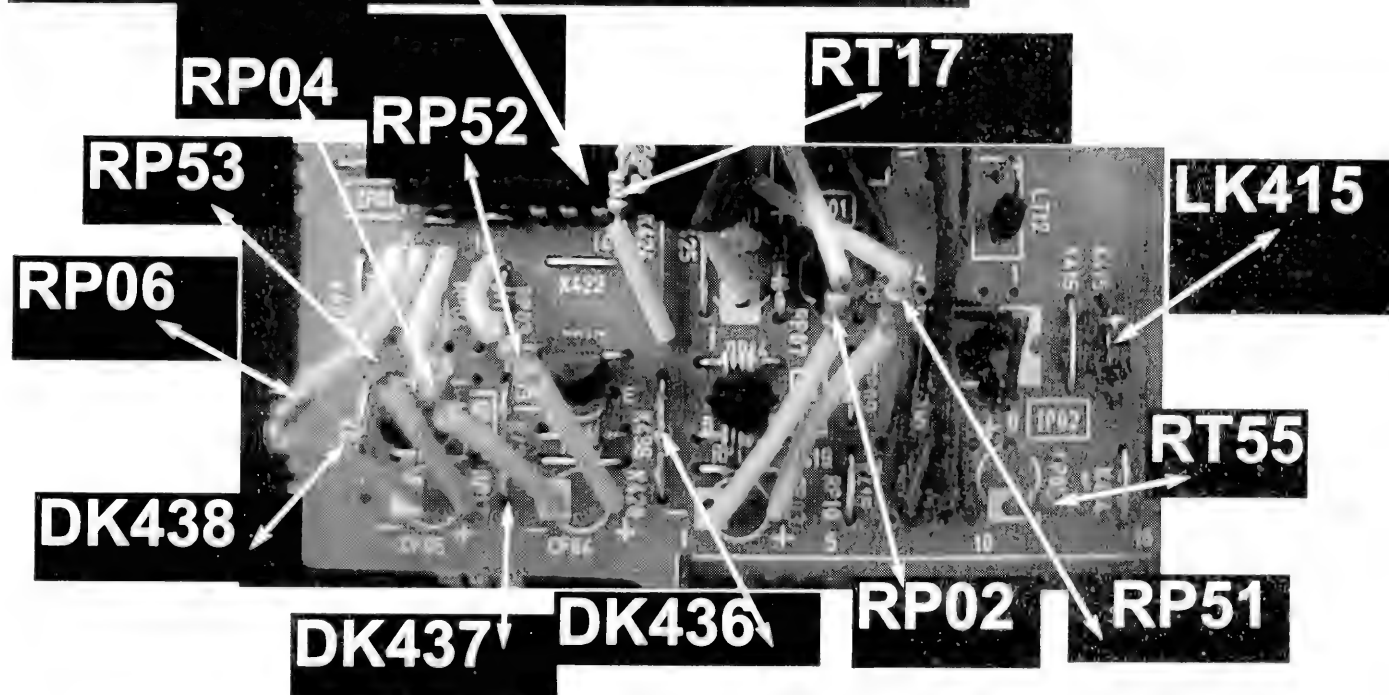
Component
Side
PA1 IF/MTS P.W.B.

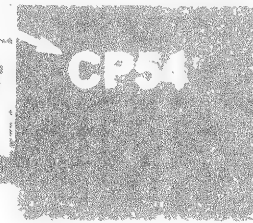
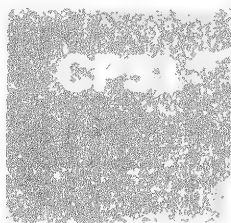
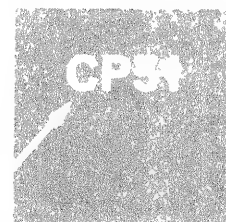
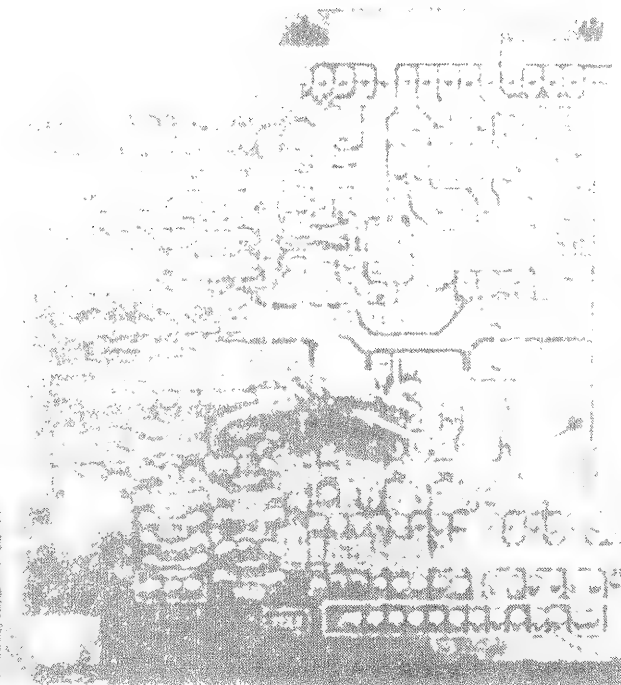
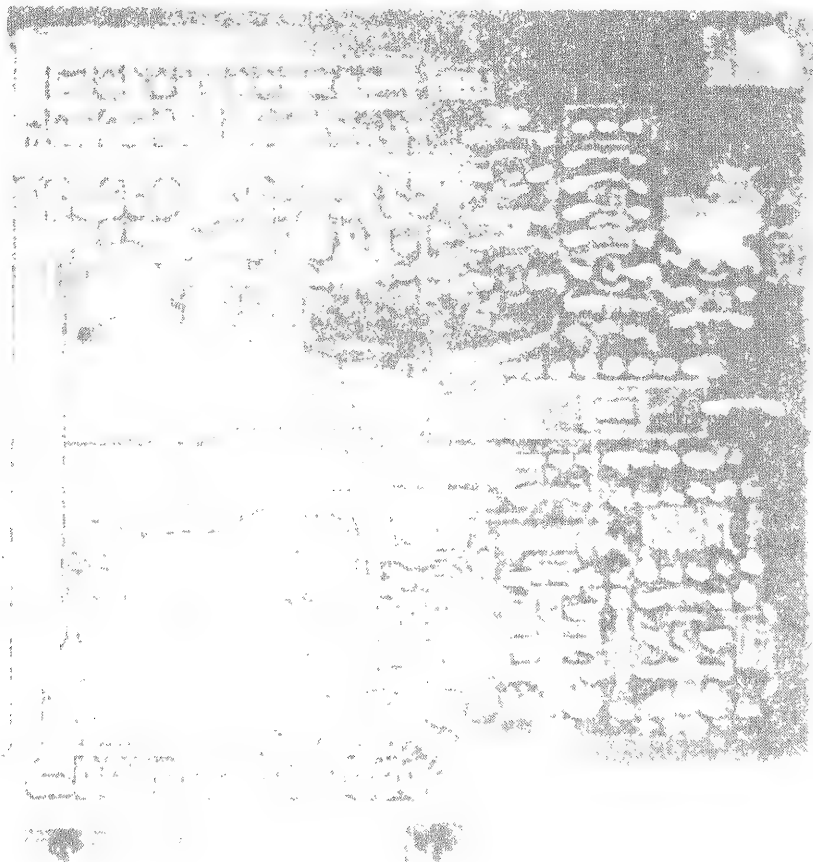


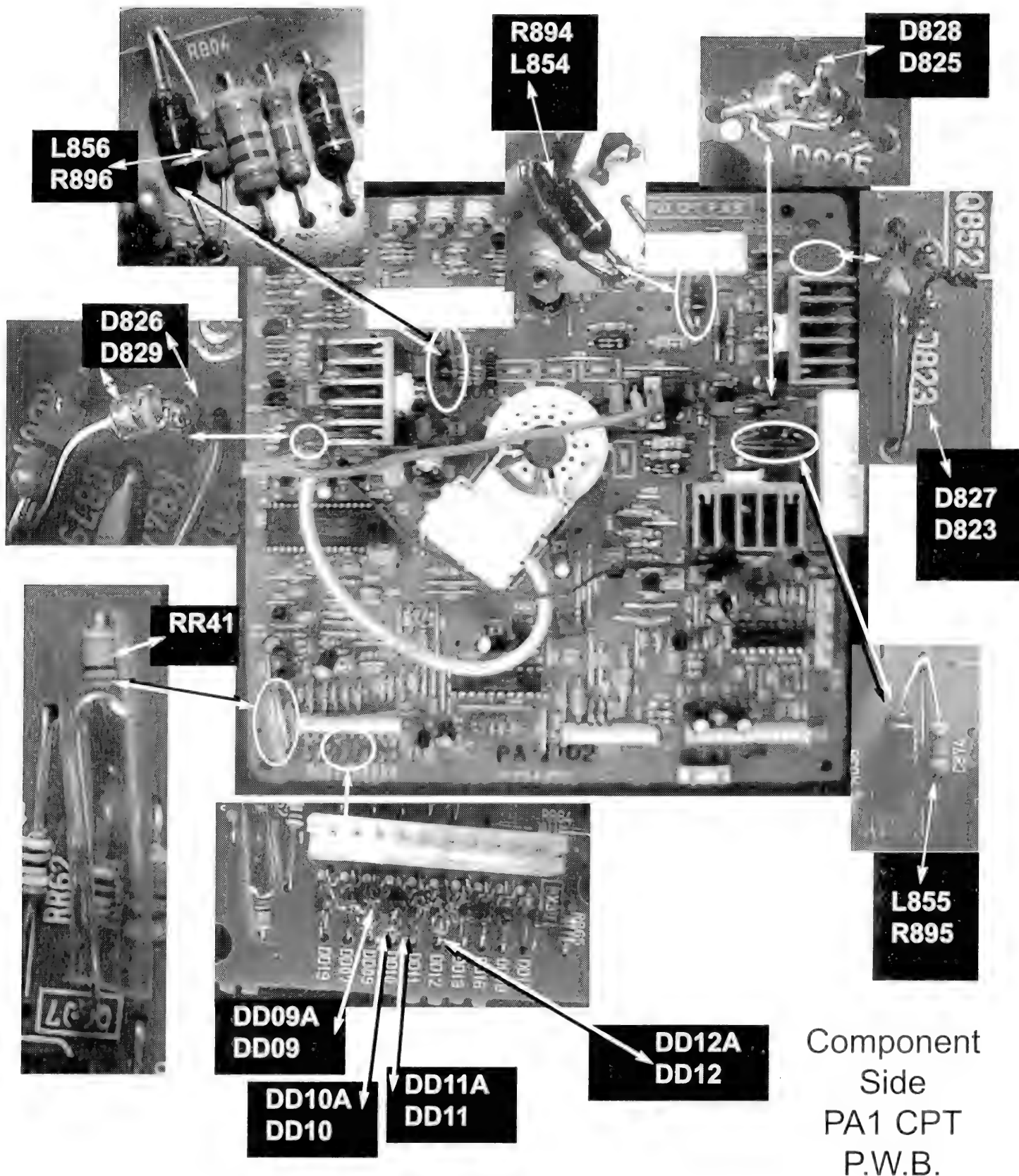
Pattern
Side of
PA1 IF/MTS P.W.B.



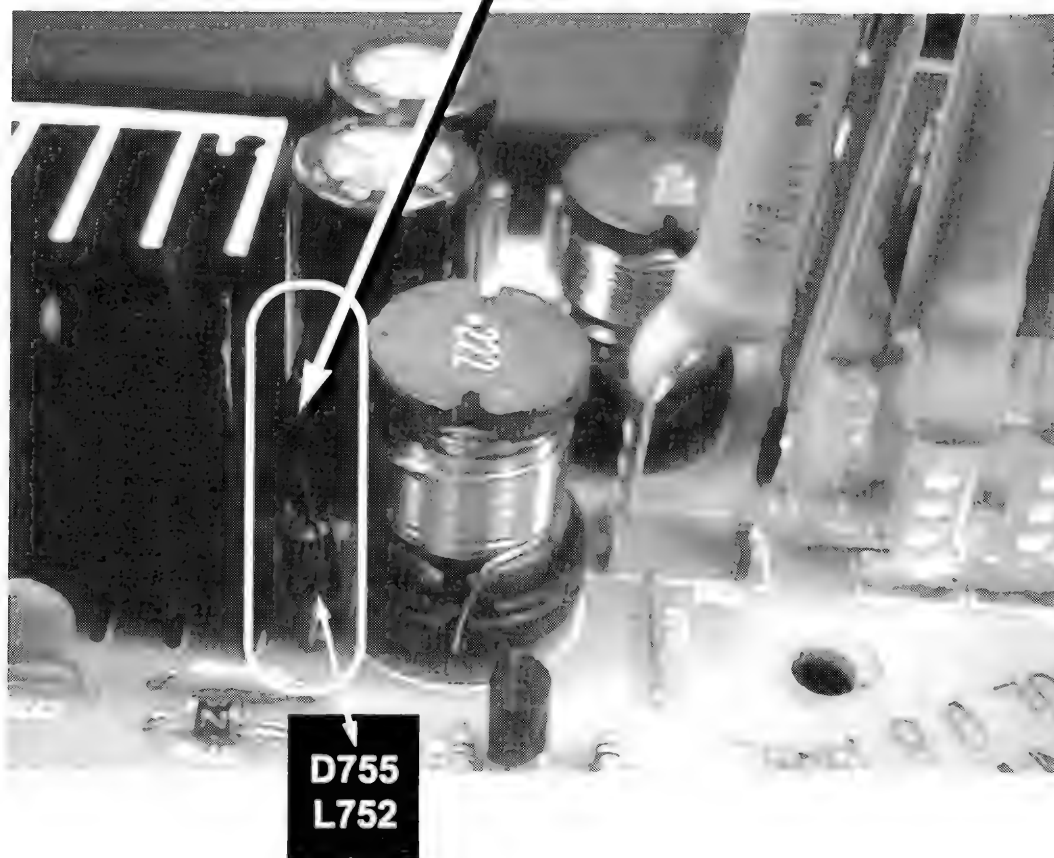
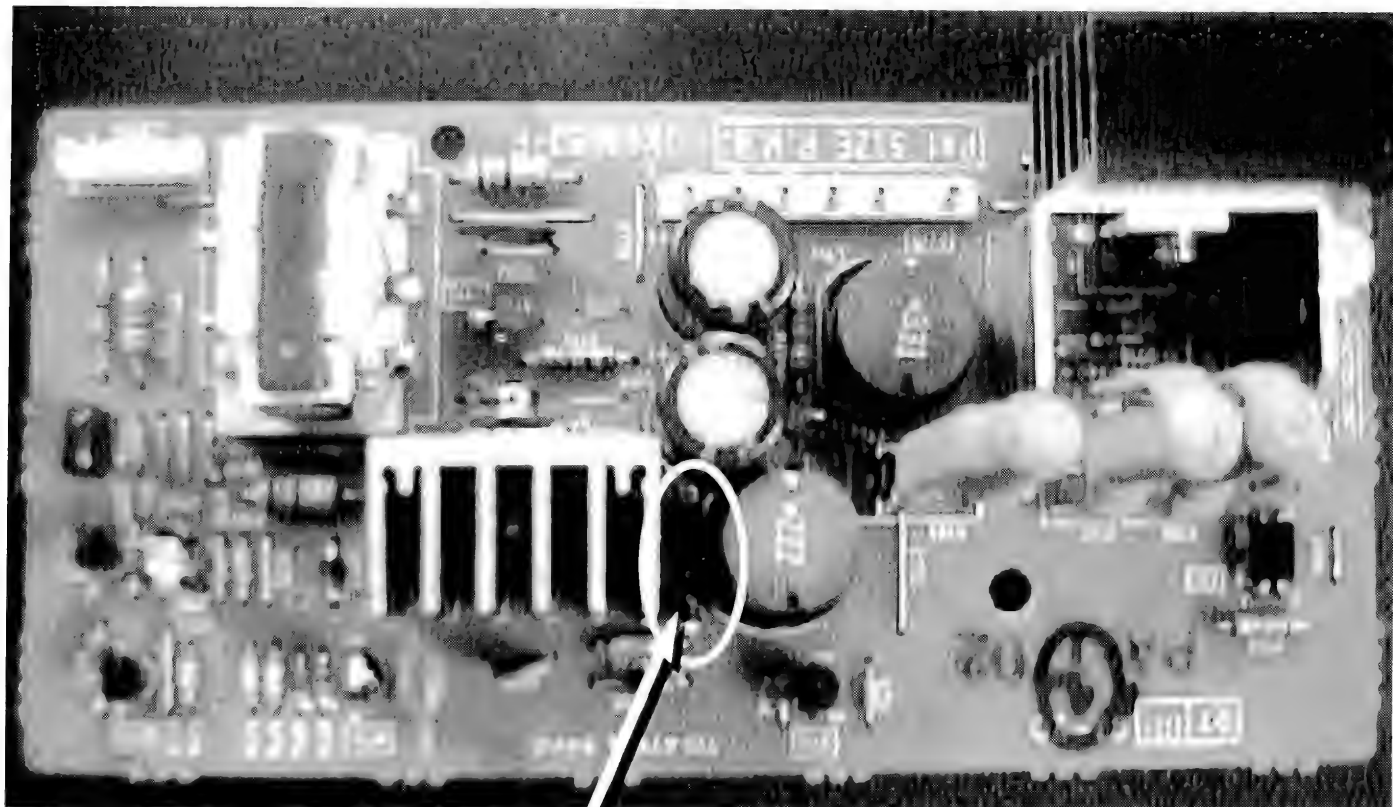
Component
Side
PA1 SOUND P.W.B.



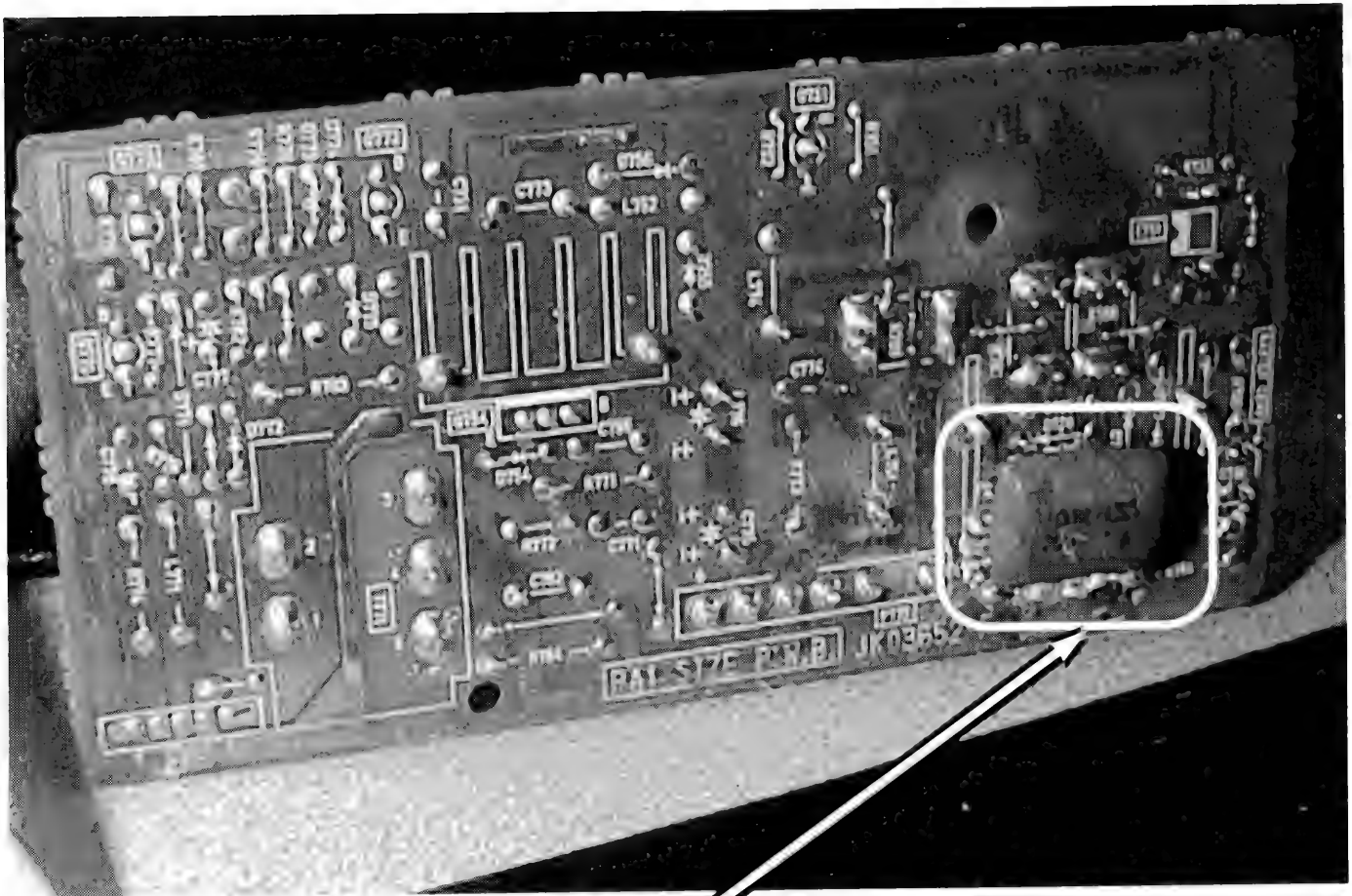




PA-1 H. SIZE P.W.B. - COMPONENT SIDE

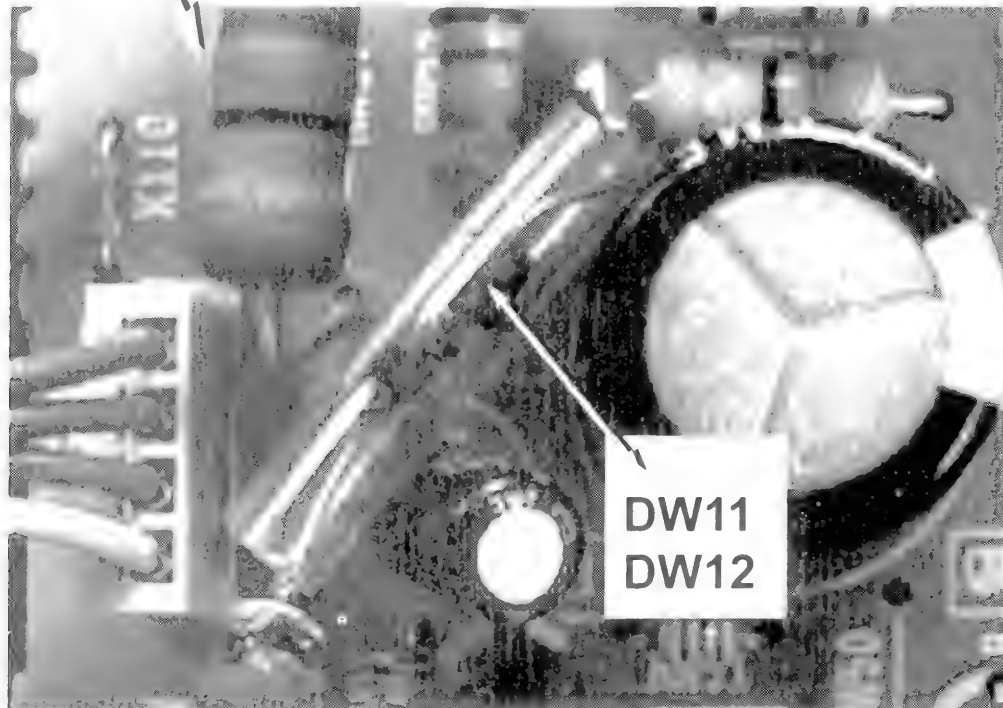


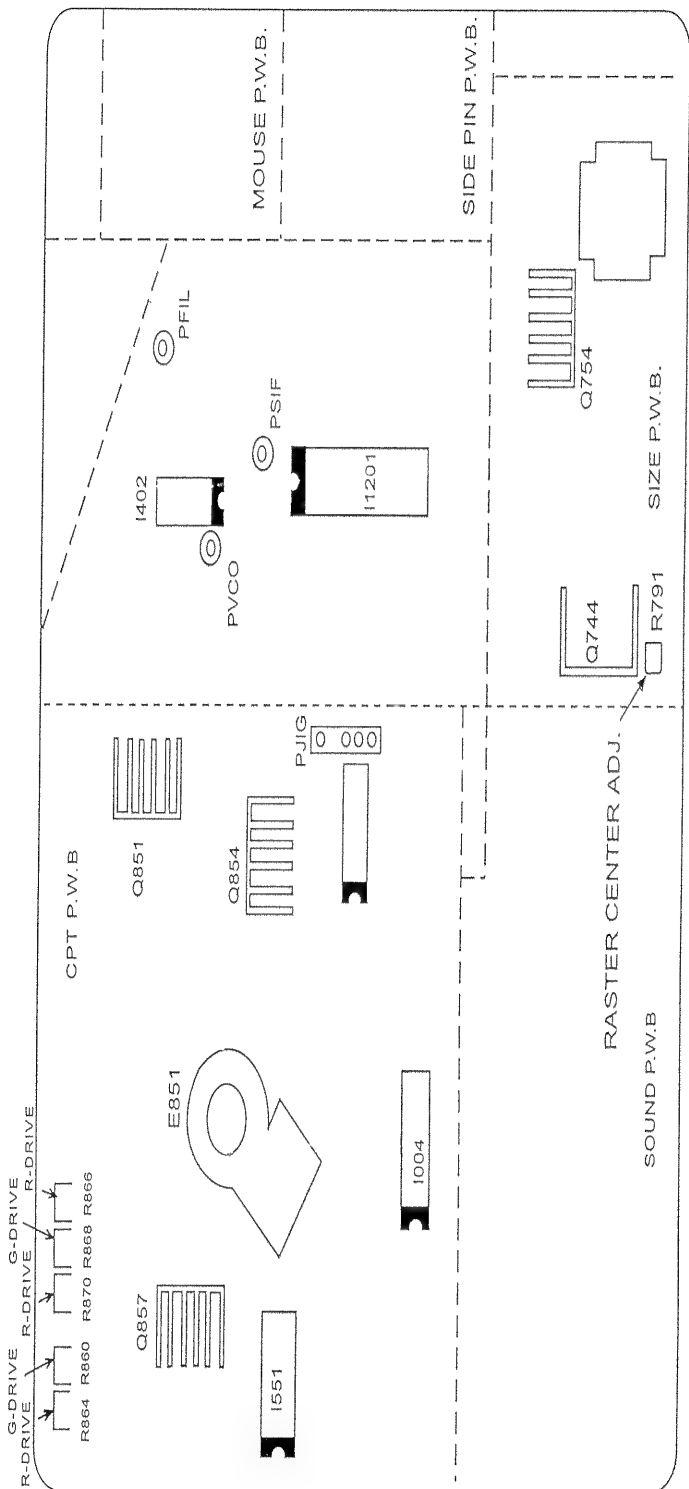
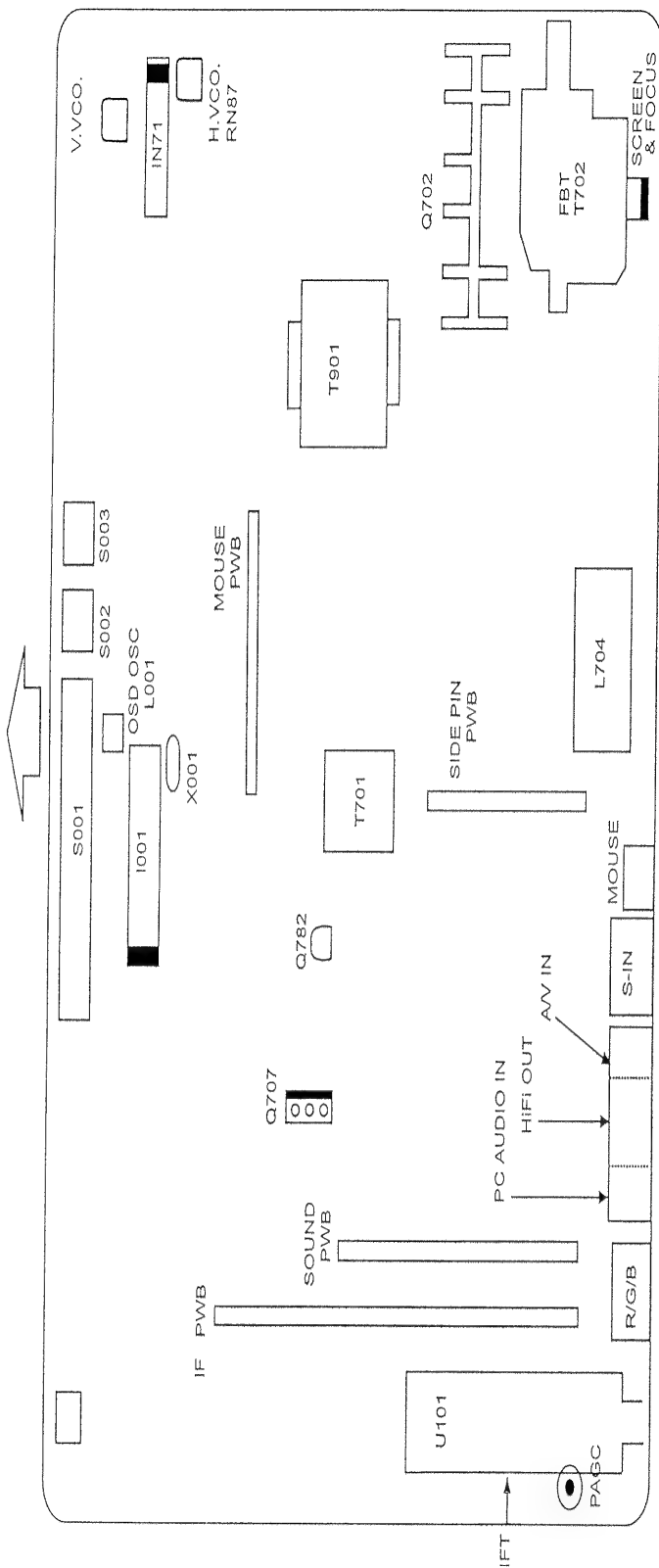
Pattern
Side of
PA1 H. SIZE PWB



C783

PA-1 VM P.W.B. - COMPONENT SIDE

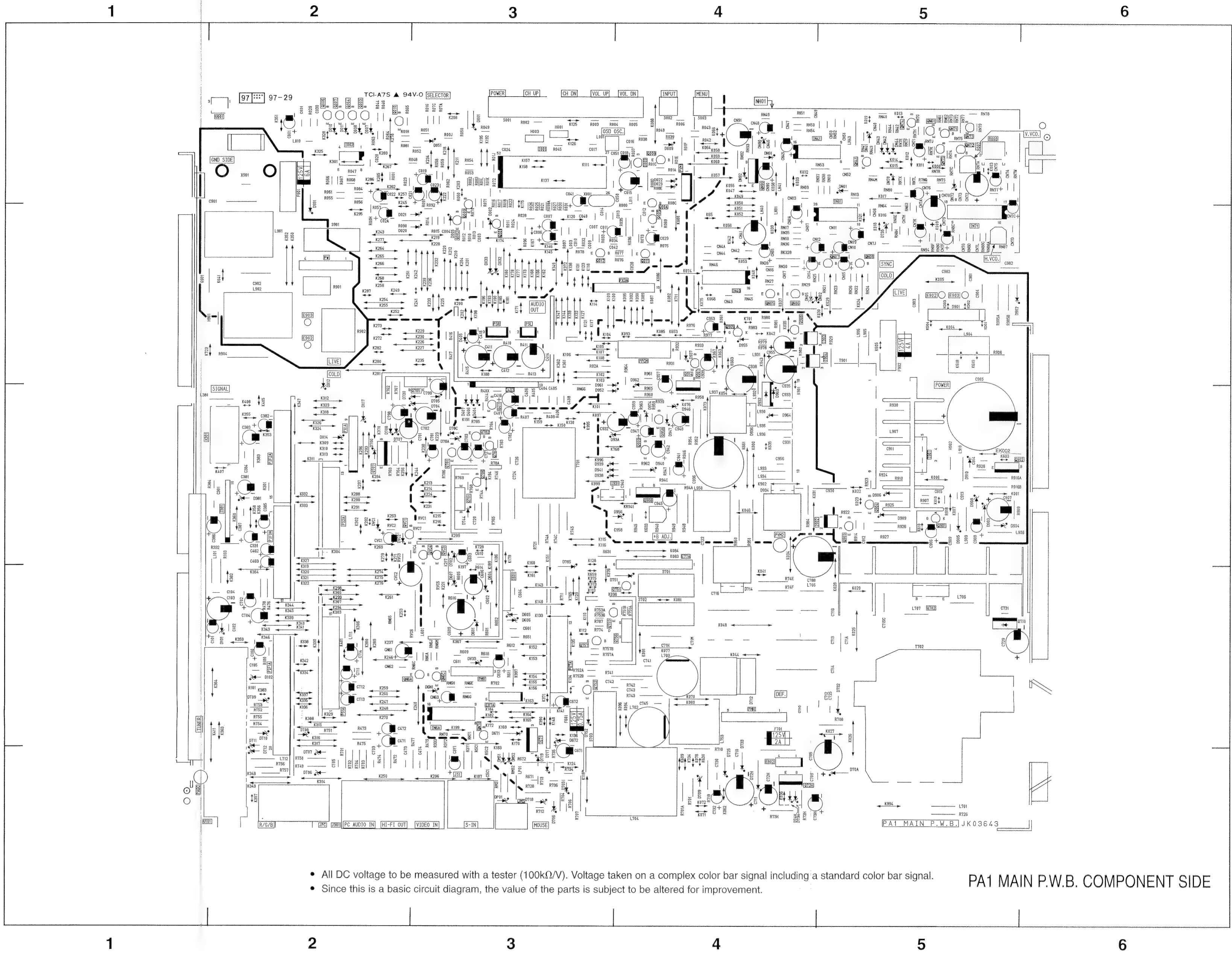




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PRINTED CIRCUIT BOARD

MAIN P.W.B.
COMPONENT SIDE

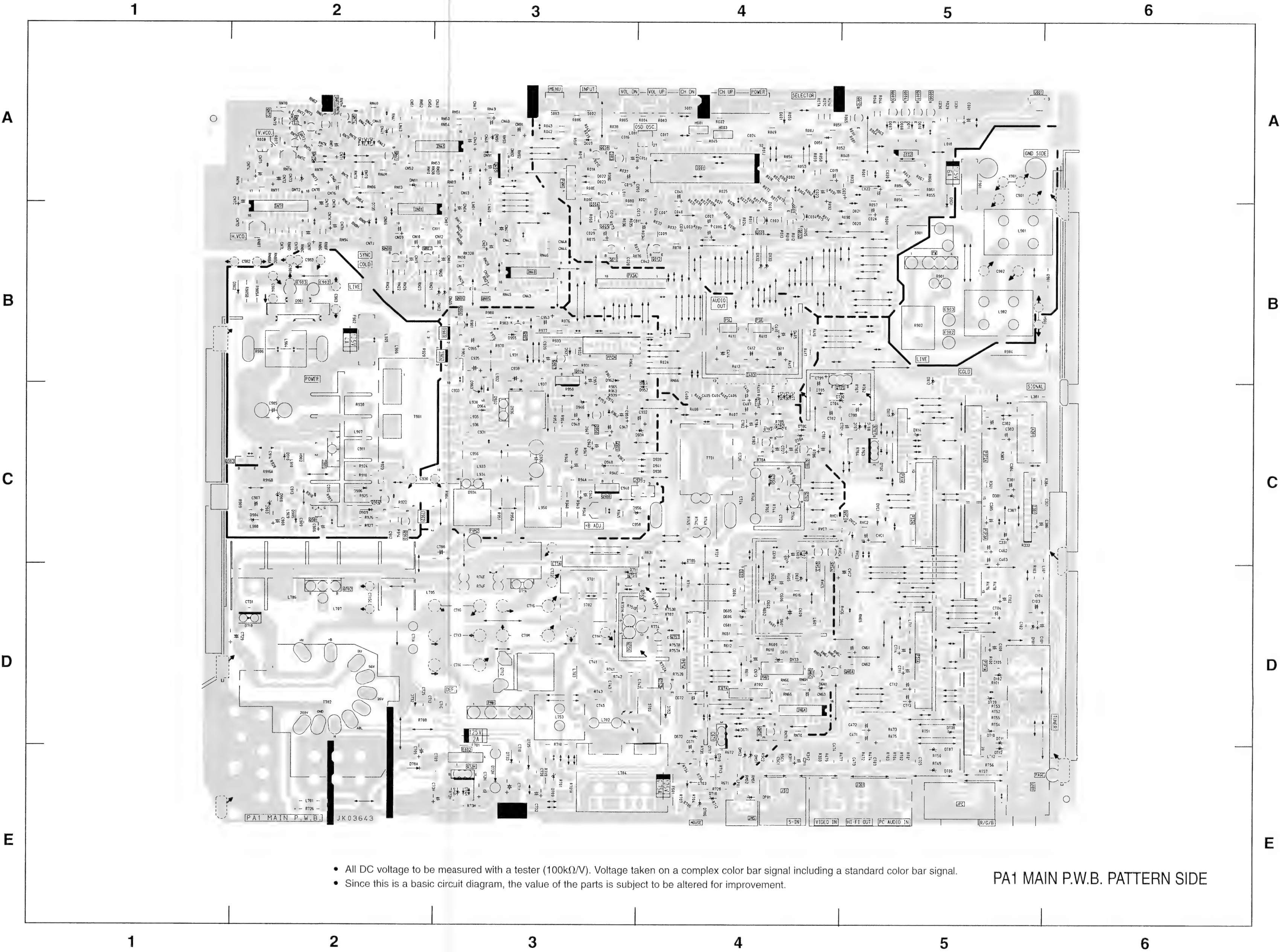


- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1 MAIN P.W.B. COMPONENT SIDE

PRINTED CIRCUIT BOARD

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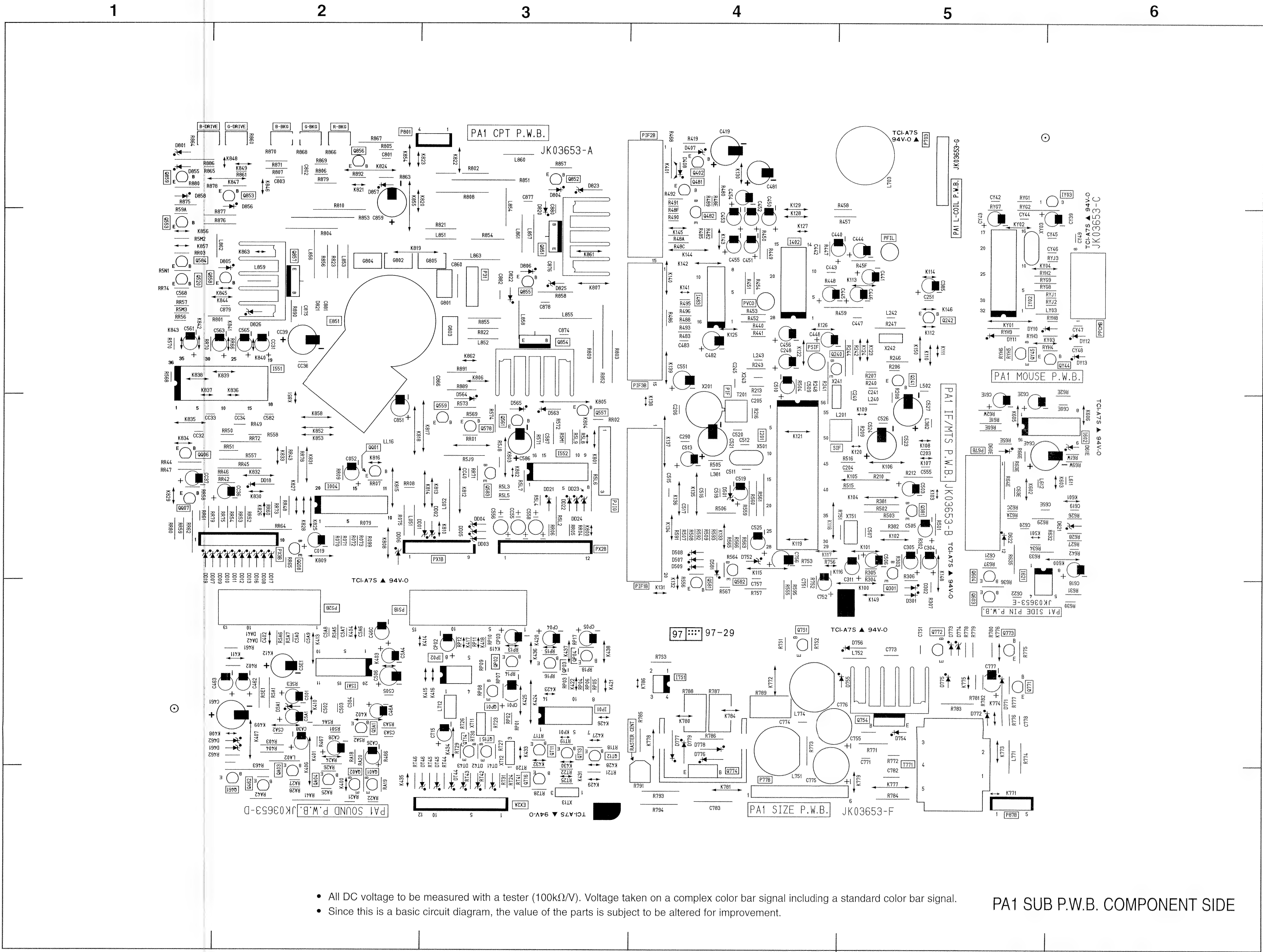
- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

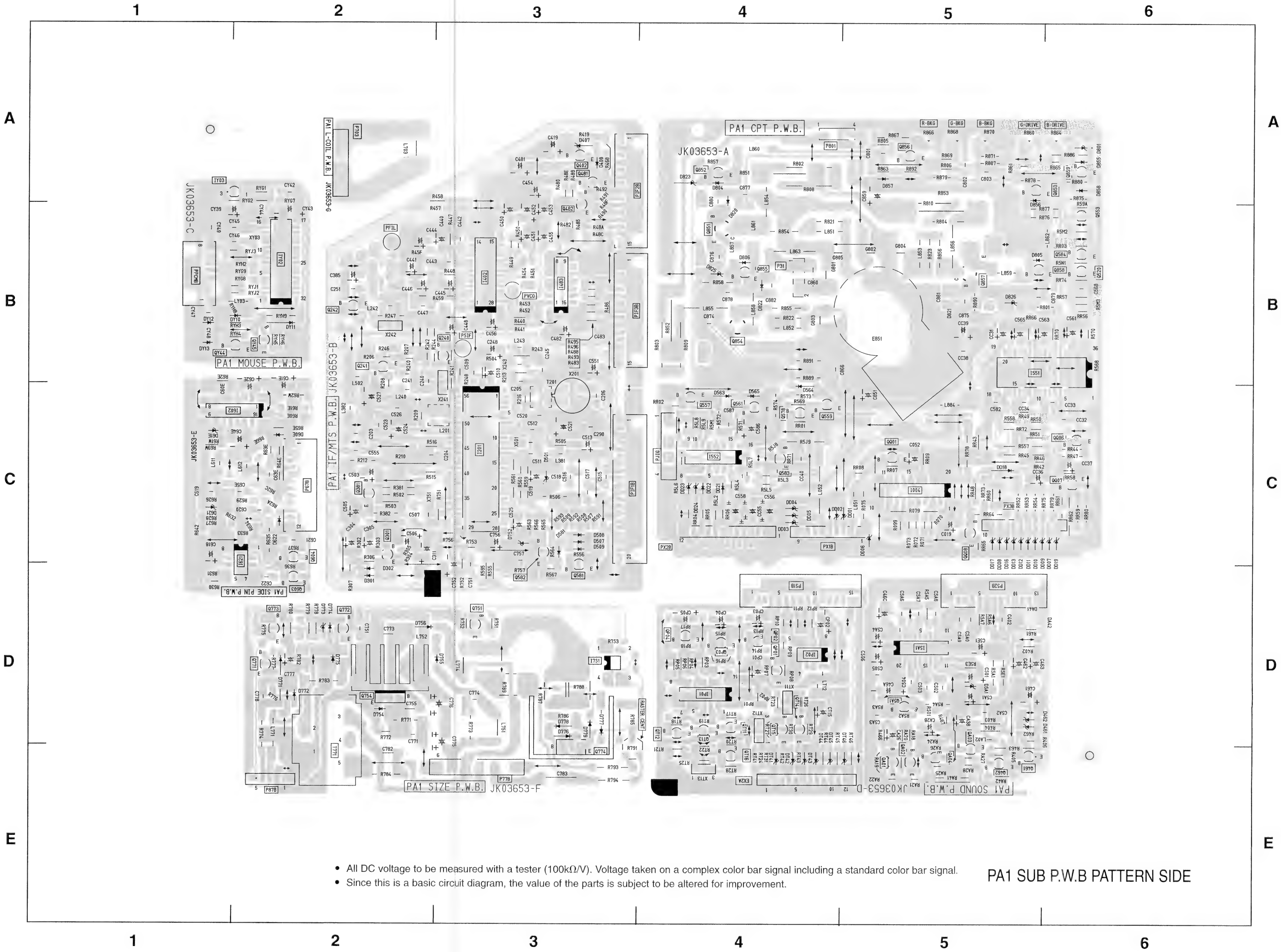
PA1 MAIN P.W.B. PATTERN SIDE

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PRINTED CIRCUIT BOARD

SUB P.W.B
COMPONENT SIDE

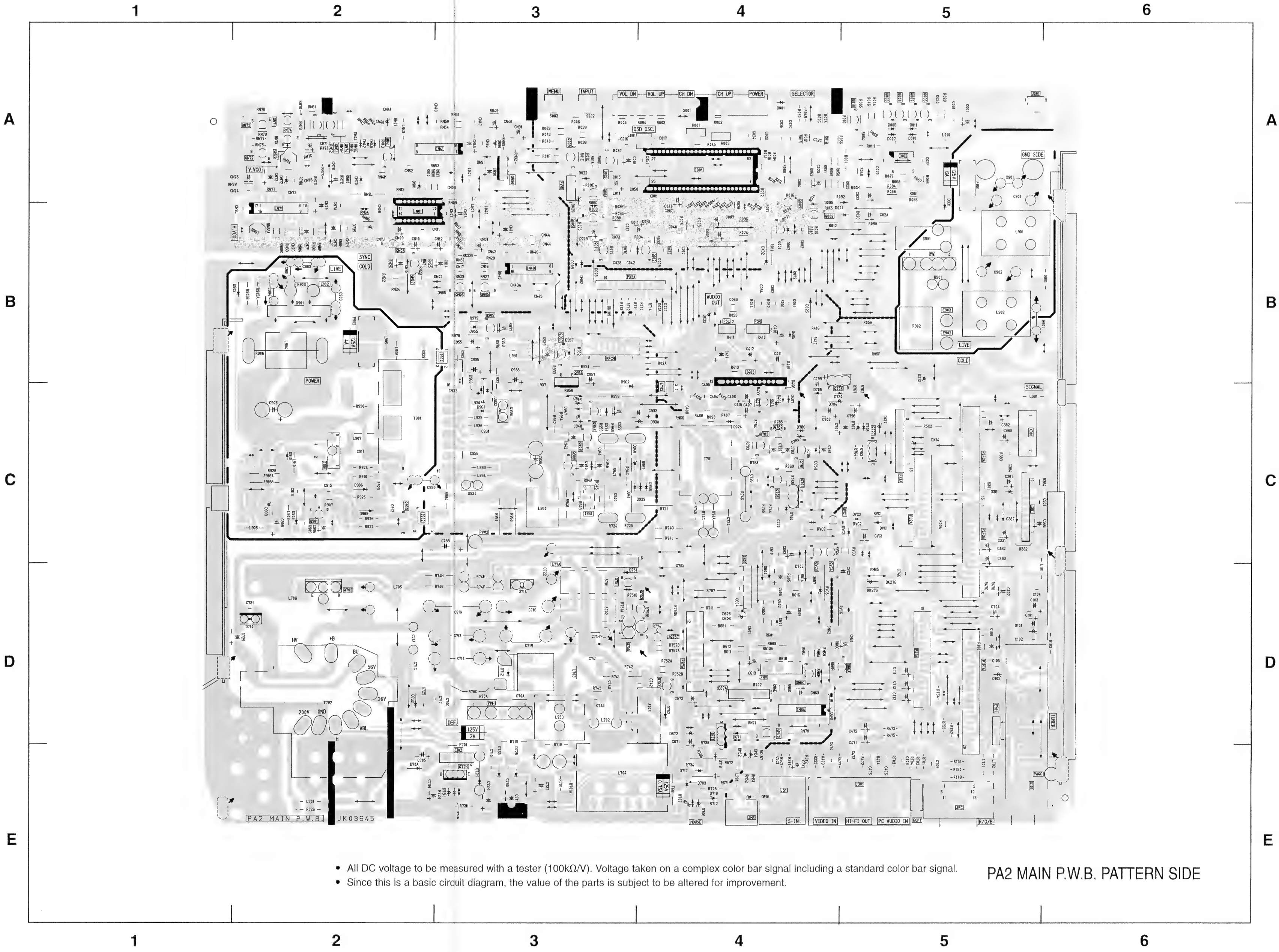




- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1 SUB P.W.B PATTERN SIDE

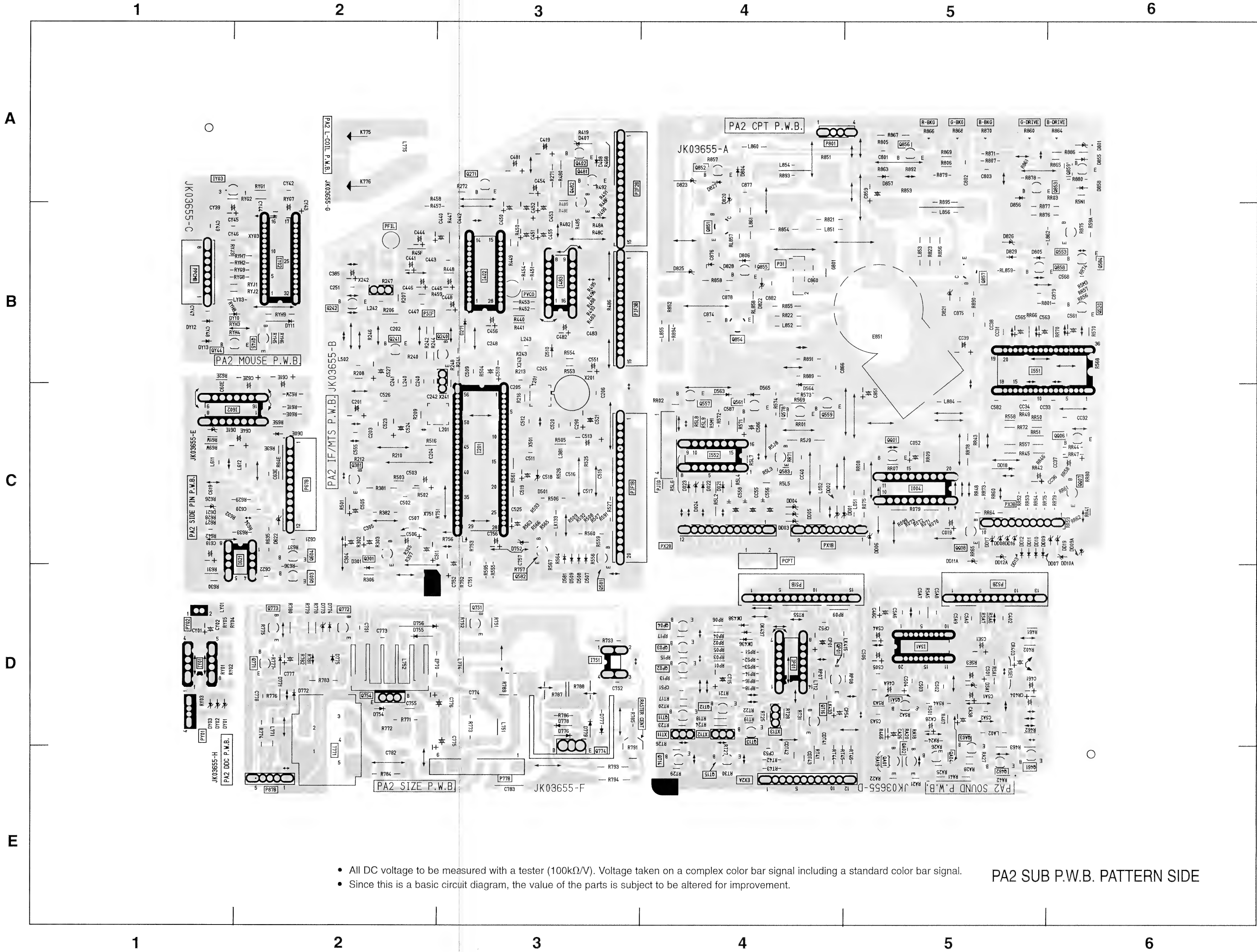




- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA2 MAIN P.W.B. PATTERN SIDE

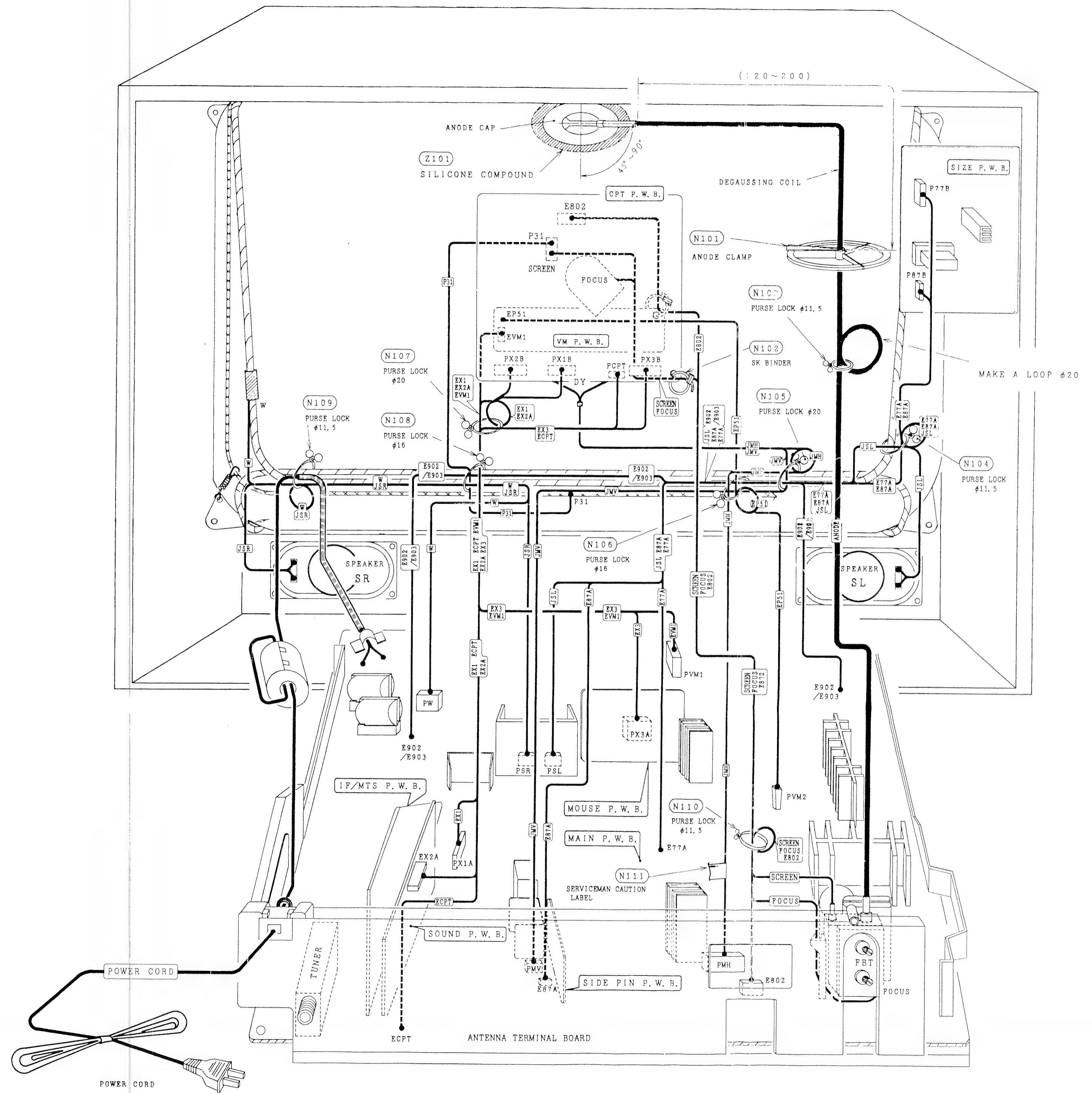




- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

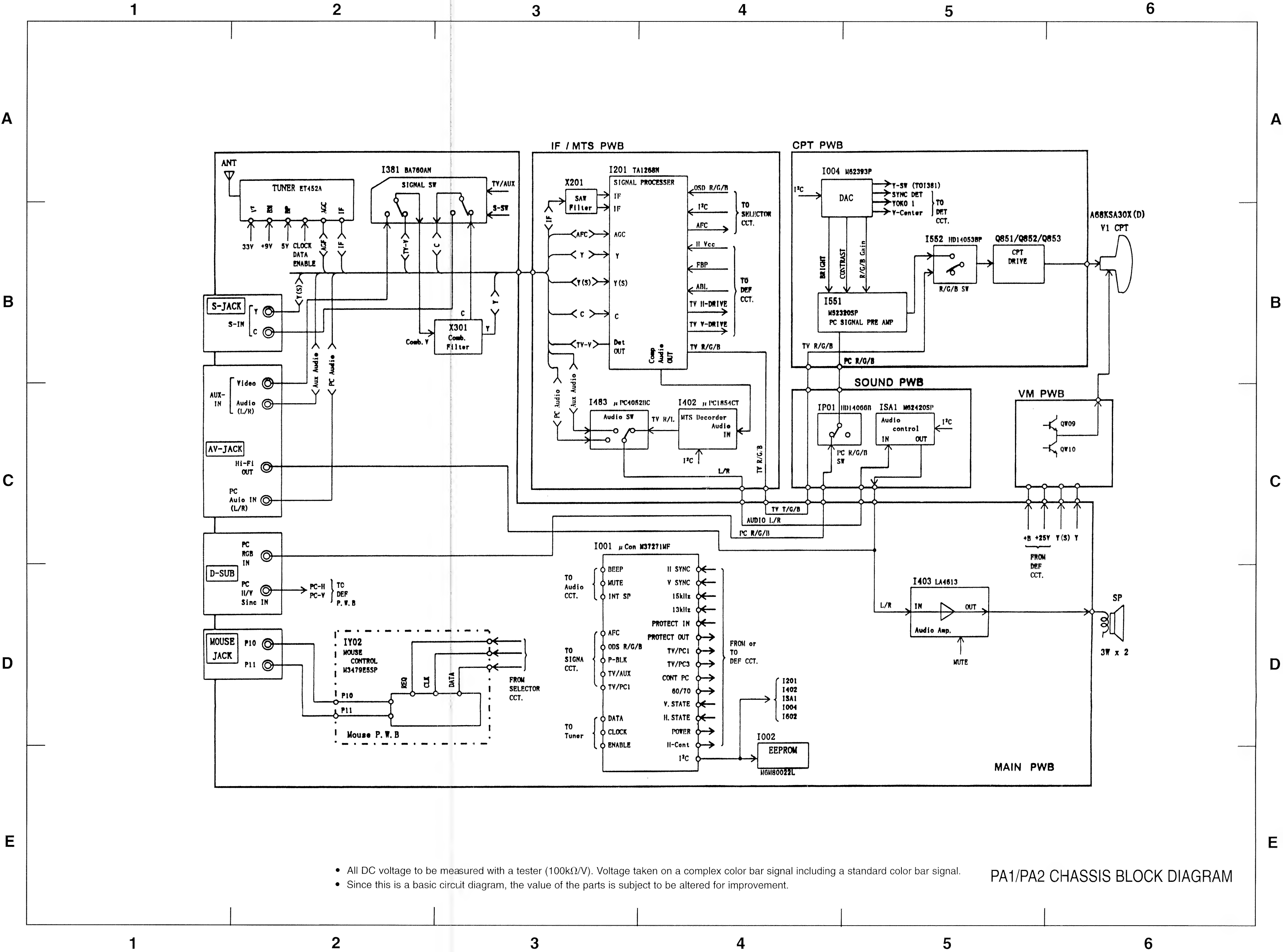
PA2 SUB P.W.B. PATTERN SIDE

WIRING DRAWING OF 27MM20B/27MM20BA FINAL ASSEMBLY



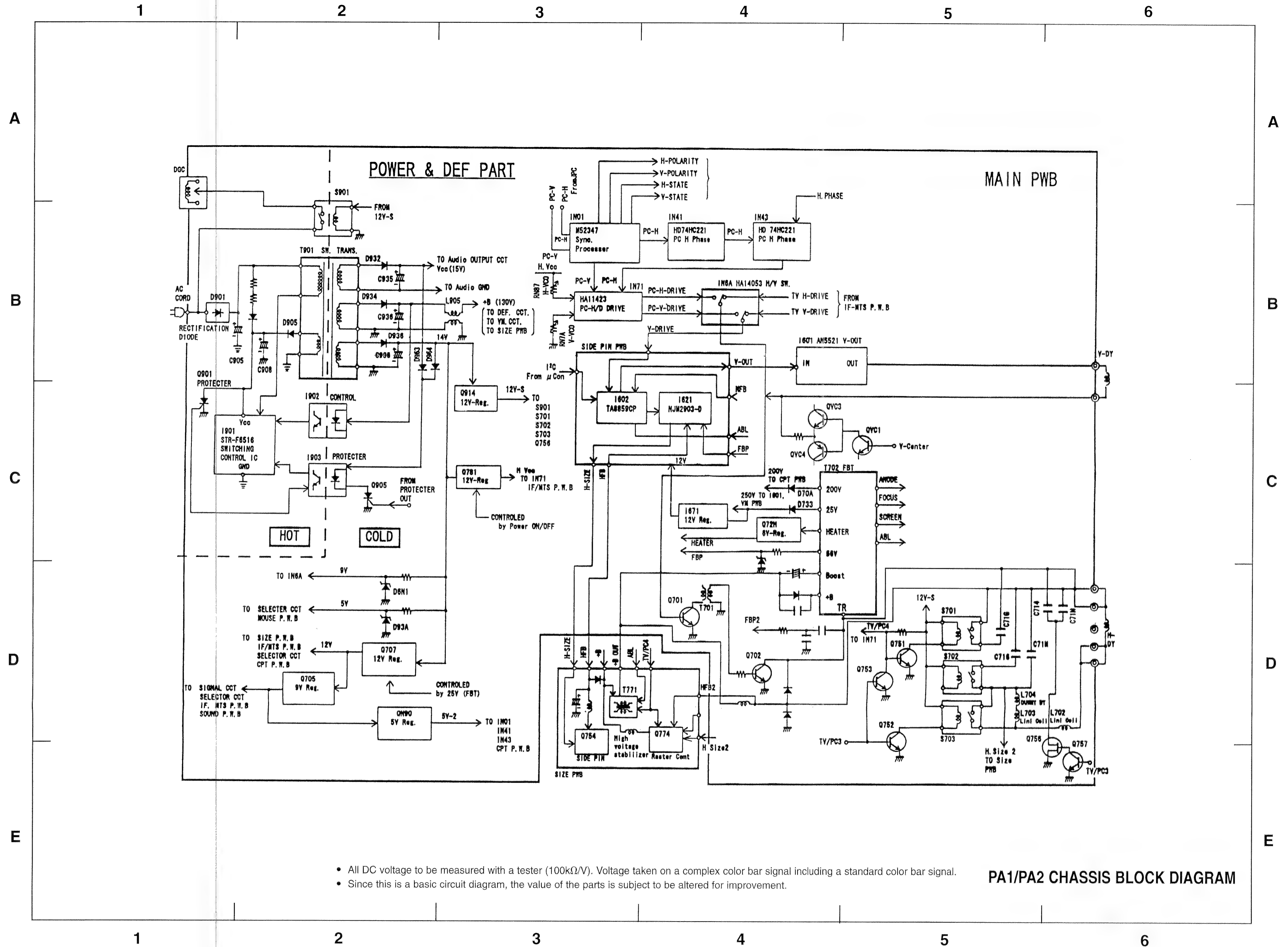
BASIC CIRCUIT DIAGRAM

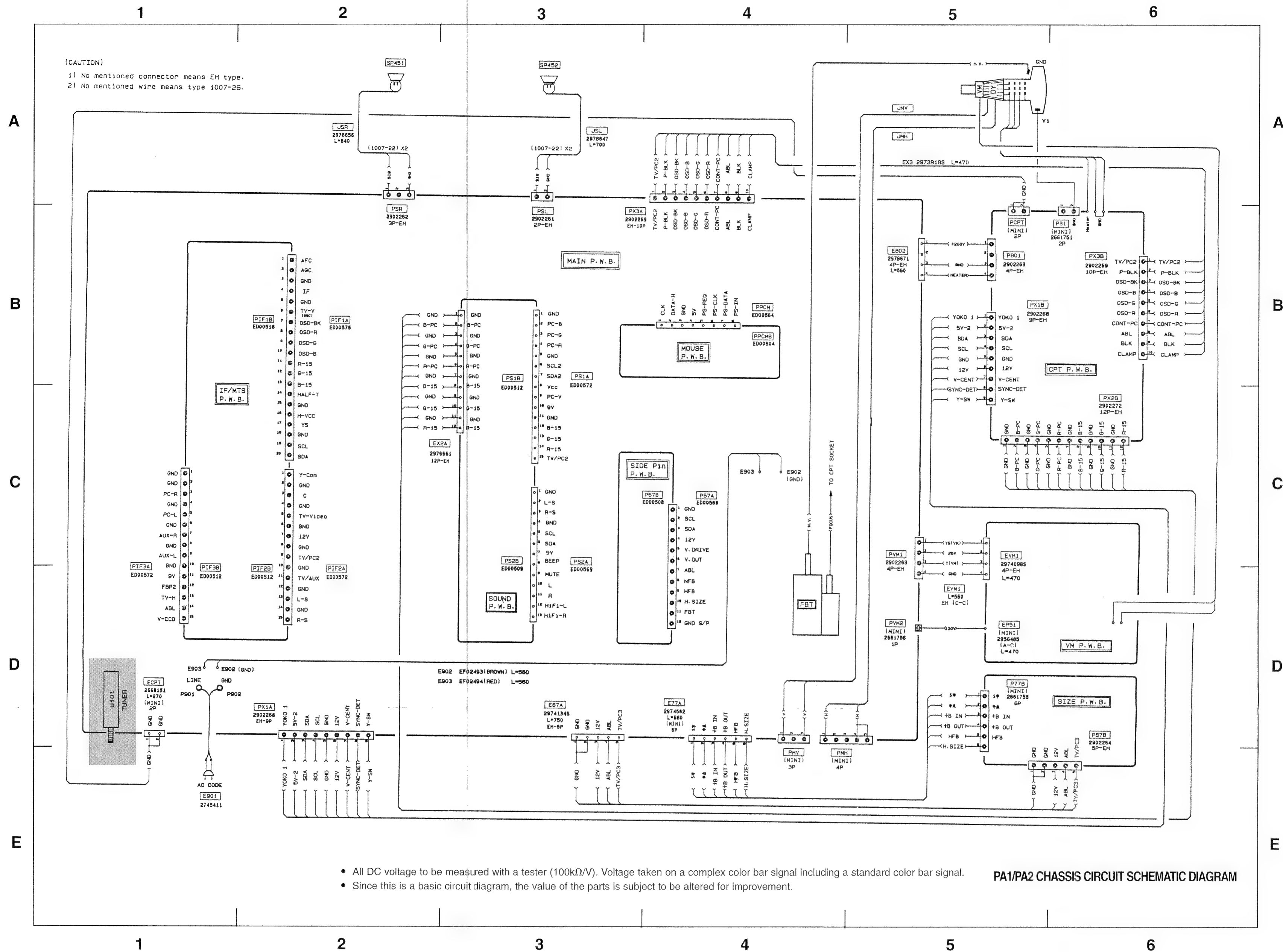
PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.




- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1/PA2 CHASSIS BLOCK DIAGRAM





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BASIC CIRCUIT DIAGRAM

DEFLECTION CIRCUIT
DIAGRAM

circuit no.	pin no.	DC voltage
I 601	1	0v
	2	13.15v
	3	26.7v
	4	0.73v
	5	0v
	6	1.49v
	7	26.2v

circuit no.	pin no.	DC voltage
I671	1	15.9v
	2	0v
	3	11.7v

circuit no.	pin no.	DC voltage
QVC1	b	1.7v
	c	10.4
	e	1.1v

circuit no.	pin no.	DC voltage
QVC3	b	10.4v
	c	25.7v
	e	11.0v

circuit no.	pin no.	DC voltage
QVC4	b	10.4v
	c	0v
	e	11v

circuit no.	pin no.	DC voltage
Q 701	b	0.35v
	c	74.51v
	e	0v

circuit no.	pin no.	DC voltage
Q702	b	0.91v
	c	137.13v
	e	0v

circuit no.	pin no.	DC voltage
Q 705	b	9.94v
	c	12.21v
	e	9.33v

circuit no.	pin no.	DC voltage
Q 706	b	13.4v
	c	0.834v
	e	13.46v

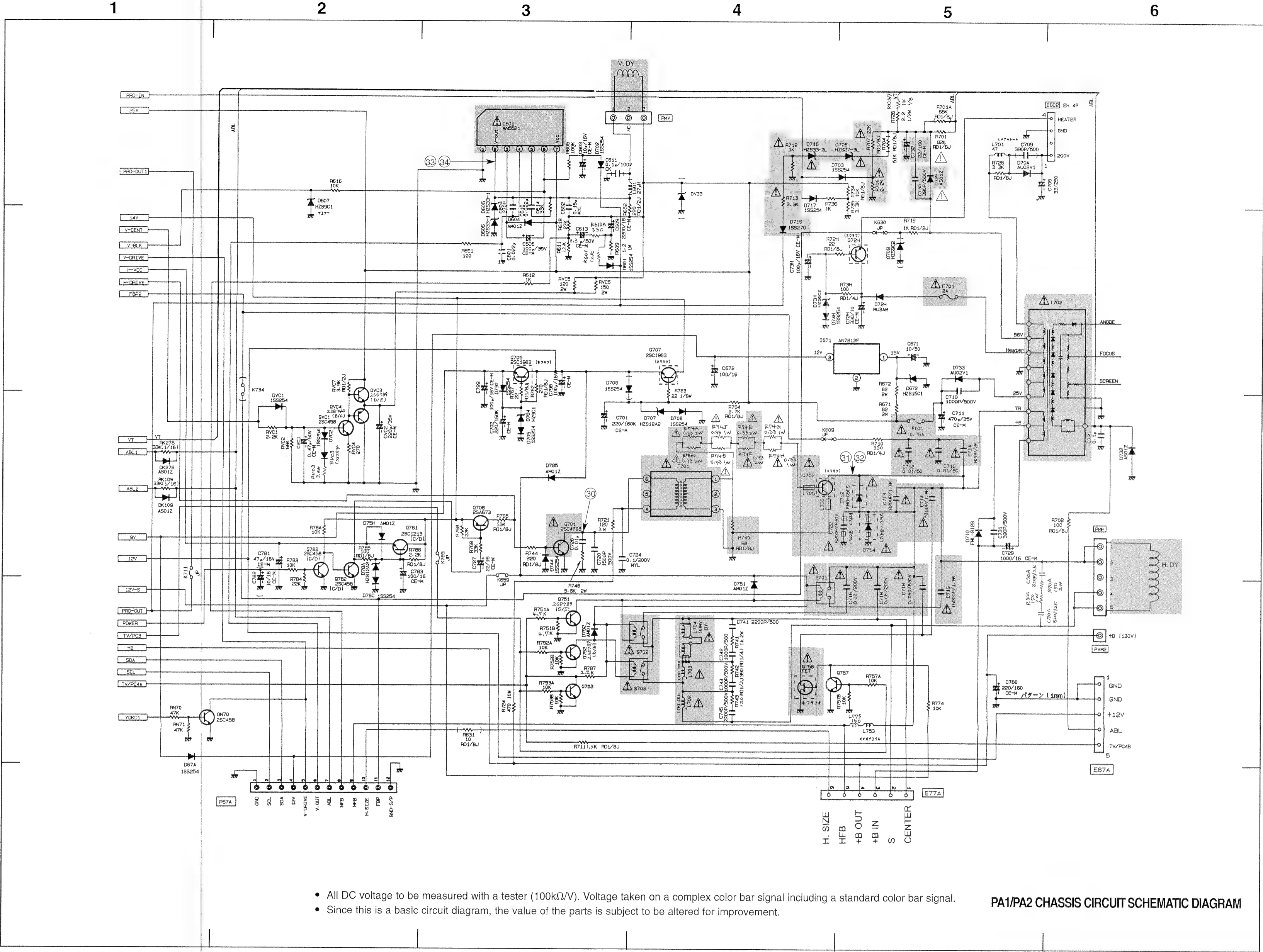
circuit no.	pin no.	DC voltage
Q 707	b	12.8v
	c	13.4v
	e	12.2v

circuit no.	pin no.	DC voltage
Q 72H	b	6.7v
	c	7.3v
	e	6.1v

circuit no.	pin no.	DC Voltage
Q751	b	TV mode 0.6v
	c	TV mode 0v
	d	PC mode 11.5v
	e	0v

circuit no.	pin no.	DC Voltage
Q752	b	TV mode 0v
	c	TV mode 11.5v
	d	PC mode 0v
	e	0v

circuit no.	pin no.	DC Voltage
Q753	b	TV mode 0v
	c	TV mode 6.8v
	d	PC mode 0v
	e	0v



- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1/PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

circuit no.	pin no.	DC Voltage
Q756	d	TV mode 95.2v
	g	0v
	s	0v
	s	0v

circuit no.	pin no.	DC Voltage
Q757	b	TV mode 0.6v
	c	TV mode 11.5v
	d	PC mode 0v
	e	0v


circuit no.	pin no.	DC voltage
Q781	b	12.1v
	c	13.3v
	e	11.5v

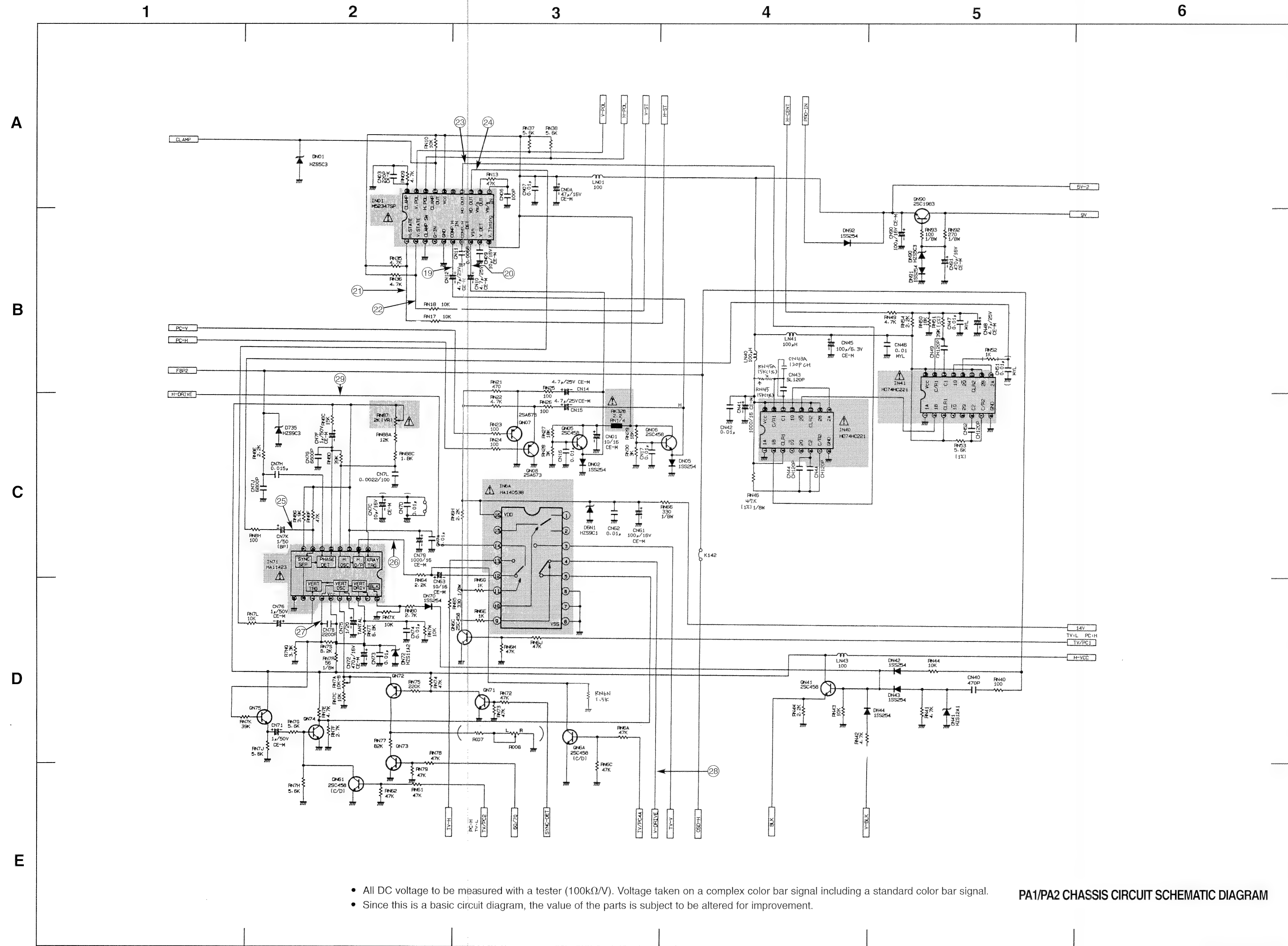
circuit no.	pin no.	DC voltage
Q782	b	0v
	c	12.1v
	e	0v

circuit no.	pin no.	DC voltage
Q783	b	0.6v
	c	0v
	e	0v

circuit no.	pin no.	DC voltage
QN70	b	0v
	c	3.6v
	e	0v

BASIC CIRCUIT DIAGRAM

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- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1/PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

circuit no.	pin no.	DC volt / PC mode
IN40	1	0v
	2	0.85v
	3	5.43v
	4	4v
	5	2.1v
	6	0v
	7	3.4v
	8	0v
	9	1.3v
	10	5.43v
	11	5.43v
	12	3.3v
	13	1.4v
	14	0v
	15	4v
	16	5.43v

circuit no.	pin no.	DC volt / PC mode
IN41	1	0v
	2	3.3v
	3	5.43v
	4	3.55v
	5	0.12v
	6	0v
	7	5.26v
	8	0v
	9	1.86v
	10	5.43v
	11	5.43v
	12	5.28v
	13	1.86v
	14	0v
	15	3.2v
	16	5.43v

circuit no.	pin no.	DC volt / PC mode
IN71	1	7.2v
	2	5.82v
	3	5.27v
	4	3.25v
	5	9.89v
	6	2.8v
	7	2.8v
	8	2.3v
	9	11.14v
	10	11.25v
	11	3.14v
	12	5.89v
	13	5.92v
	14	11.29v
	15	2.8v
	16	0v
	17	0v
	18	0v

circuit no.	pin no.	PC mode	TV mode
IN6A	1	0.16v	0.16v
	2	0.19v	0.19v
	3	3.72v	3.66v
	4	4v	3.66v
	5	4v	4v
	6	0v	0v
	7	0v	0v
	8	0v	0v
	9	0v	9.16v
	10	0v	0v
	11	0v	9.16v
	12	0.5v	0.1v
	13	1v	0.9v
	14	0.4v	0.8v
	15	.13v	0v
	16	7.71v	9.16v

circuit no.	pin no.	DC voltage
QN05	b	0.55v
	c	5.34v
	e	0.14v
	f	0.55v
QN06	b	0.55v
	c	5.34v
	e	0.14v
	f	.45v
QN07	b	8.6v
	c	0v
	e	9.2v
	f	0.16v
QN08	b	0v
	c	0v
	e	0.7v
	f	0.9v
QN41	b	11.25v
	c	11.33v
	e	0.78v
	f	0.8v

circuit no.	pin no.	DC voltage
QN61	b	0.6v
	c	0v
	e	0v
	f	0.6v
QN71	b	11.19v
	c	0v
	e	0v
	f	0v
QN72	b	10.96v
	c	0v
	e	3.25v
	f	3.26v
QN73	b	0v
	c	0v
	e	0v
	f	0v
QN74	b	0v
	c	4.1v
	e	0v
	f	0v
QN75	b	2.7v
	c	11.25v
	e	2.1v
	f	2.11v


circuit no.	pin no.	DC voltatage
QN90	b	6v
	c	9.3v
	e	5.45v
	f	5.45v
QN6A	b	0.6v
	c	0v
	e	0v
	f	2.22v
QN6C	b	0v
	c	9v
	e	0v
	f	0v

circuit no.	pin no.	DC volt / PC mode
IN01	1	4.3v
	2	4.3v
	3	0v
	4	3.3v
	5	0v
	6	2.5v
	7	0.7v
	8	2.5v
	9	1.1v
	10	5.34v
	11	1v
	12	0.8v
	13	0.2v
	14	0.8v
	15	4.7v
	16	5.34v
	17	0.3v
	18	1.62v
	19	1.62v
	20	3.17v

E



- ### PA1/PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

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BASIC CIRCUIT DIAGRAM

SIGNAL CIRCUIT
DIAGRAM 4/4

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
I001	1	4.18v	4.05
	2	4.72v	4.72v
	3	2.54v	2.54v
	4	4.94v	4.9v
	5	3.72v	1.85v
	6	4.97v	0.38v
	7	0v	0v
	8	4.89v	4.73v
	9	4.99v	4.95v
	10	0v	4.86v
	11	0v	1.74v
	12	0v	0v
	13	0v	0v
	14	0v	0v
	15	4.97v	4.93v
	16	4.97v	4.94v
	17	4.98v	4.94v
	18	4.98v	4.94v
	19	2.11v	2.81v
	20	2.11v	2.79v
	21	0.16v	0.1v
	22	2.17v	1.52v
	23	0v	0v
	24	2.21v	2.4v
	25	1.8v	1.81v

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
I001	26	0v	0v
	27	4.98v	4.94v
	28	4.98v	3.17v
	29	4.98v	3.12v
	30	4.96v	4.92v
	31	4.96v	4.92v
	32	0v	0v
	33	4.91v	0v
	34	0v	0v
	35	0v	4.93v
	36	1.21v	1.2v
	37	4.54v	4.3v
	38	0v	0.1v
	39	4.16v	4.3v
	40	0v	0v
	41	0v	0v
	42	4.98v	4.94v
	43	4.98v	1.27v
	44	4.98v	1.28v
	45	0.86v	0.87v
	46	0v	0v
	47	0v	0v
	48	0v	0v
	49	0v	0v
	50	0v	0v
	51	0v	0v
	52	0v	0v

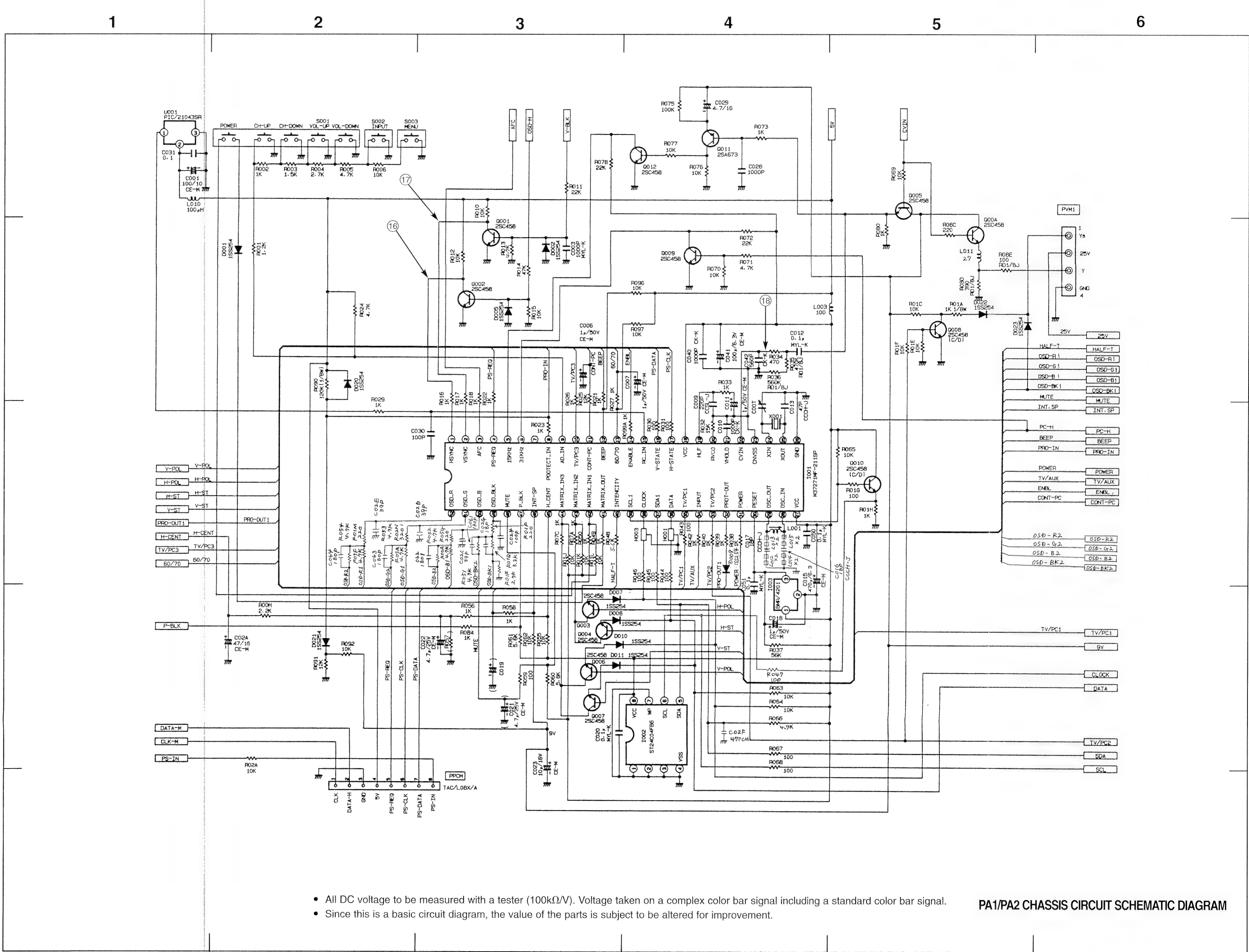
circuit no.	pin no.	DC voltage	
		TV mode	PC mode
I002	1	0v	
	2	0v	
	3	0v	
	4	0v	
	5	4.5v	
	6	3.6v	
	7	0v	
	8	4.98v	

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
I003	1	4.98v	
	2	0v	
	3	4.95v	

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
Q001	b	0v	
	c	4.72v	
	e	0v	

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
Q002	b	0v	
	c	4.18v	
	e	0v	

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
Q003	b	0v	1.61v
	c	4.98v	0.9v
	e	0v	0.9v
Q004	b	0.1v	1.58v
	c	4.98v	0.9v
	e	0v	0.9v

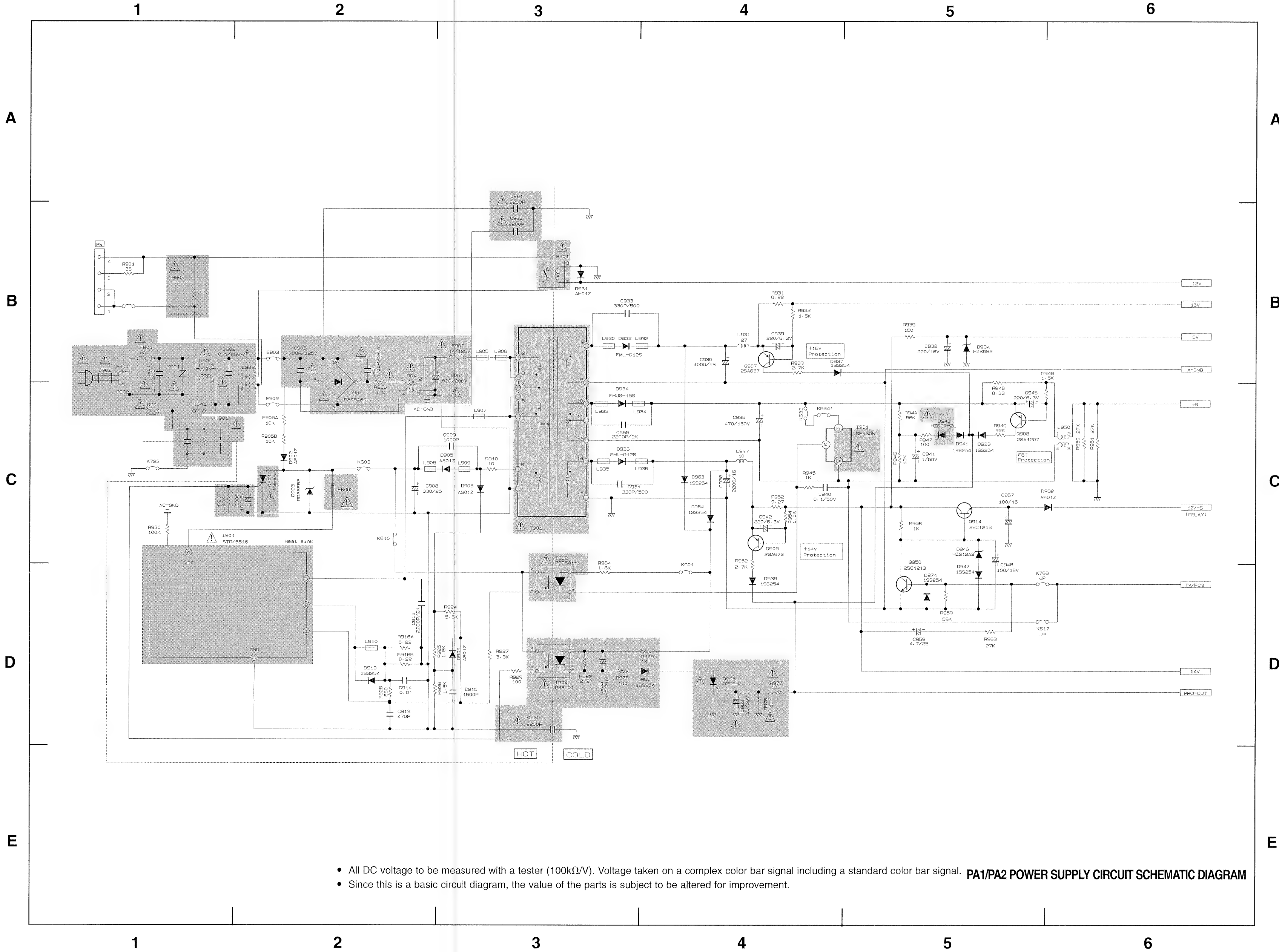


- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1/PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
Q005	b	2.17v	
	c	9.21v	
	e	1.52v	
Q006	pin no.	DC voltage	
		TV mode	PC mode
	b	0v	1.61v
	c	4.98v	0.9v
Q007	e	0v	0.9v
	b	0v	1.57v
	c	4.98v	0.9v
	e	0v	0.9v

circuit no.	pin no.	DC voltage	
		TV mode	PC mode
Q008	b	0.66v	0v
	c	0v	9.21v
	e	0v	0v
Q009	b	0.1v	0.56v
	c	4.97v	0.38v
	e	0v	0v
Q010	b	*4.2v	*4.3v
	c	4.98v	4.94v
	e	*3.5v	*3.3v
Q011	b	1.54v	1v
	c	0.3v	0.6v
	e	1.69v	1.51v
Q012	b	0.1v	0.45v
	c	3.72v	1.95v
	e	0v	0v
Q00A	b	1.8v(TV)	
	c	9.2v(TV)	
	e	1.6v(TV)	



- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1/PA2 POWER SUPPLY CIRCUIT SCHEMATIC DIAGRAM


circuit no.	pin no.	DC voltage
I 901 (HOT)	1	1.7v
	2	0v
	3	160v
	4	17.8v
	5	0v

circuit no.	pin no.	DC voltage
I 902 (COLD)	1	13.71v
	2	12.73v
	3	3v
	4	17.8v

I 904 (COLD)	1	14.50v
	2	14.50v
	3	0v
	4	17.8v

circuit no.	pin no.	DC voltage
I 931	1	129v
	2	12.6v
	3	0v

circuit no.	pin no.	DC voltage
Q 907	b	14.8v
	c	0v
	e	14.8v
Q 908	b	128.8v
	c	0v
	e	129.17v
Q 909	b	13.5v
	c	0v
	e	13.80v
Q 914	b	12.7v
	c	13.51v
	e	12v
Q 958	b	0v
	c	12.7v
	e	0v

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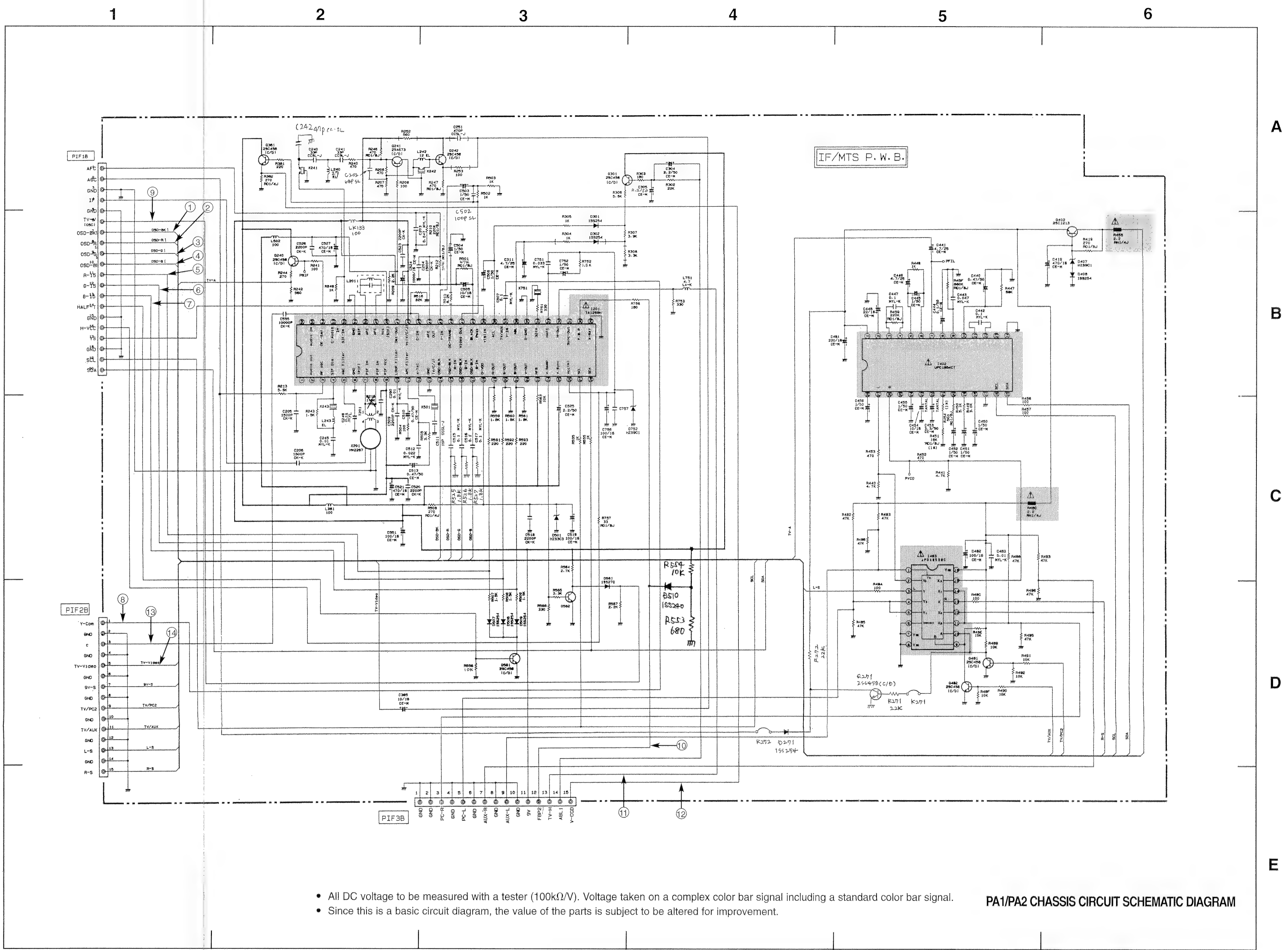
BASIC CIRCUIT DIAGRAM

IF/MTS CIRCUIT
DIAGRAM

circuit no.	pin no.	DC voltage
I201	1	0v
	2	4v
	3	7.2v
	4	3.3v
	5	4.3v
	6	0v
	7	2v
	8	2v
	9	9.2v
	10	4.6v
	11	6.3v
	12	4.8v
I201	13	0v
	14	0v
	15	4.8v
	16	4.8v
	17	4.7v
	18	3.7v
	19	2.7v
	20	2.8v
	21	2.9v
	22	4v
	23	8.7v
	24	0v
	25	7.14v
	26	9.7v
	27	3.6v
	28	4.5v

circuit no.	pin no.	DC voltage
I201	29	0v
	30	1.5v
	31	0v
	32	1.1v
	33	8.2v
	34	6.7v
	35	0v
	36	3.3v
	37	3.2v
	38	3.3v
	39	1.5v
	40	5.3v
I201	41	2.9v
	42	4.7v
	43	4.7v
	44	2.7v
	45	2.7v
	46	9.1v
	47	3.9v
	48	9.2v
	49	8.2v
	50	8.2v
	51	0v
	52	0v
	53	2.9v
	54	4v
	55	2.9v
	56	0v

circuit no.	pin no.	DC voltage
I402	1	9.23v
	2	4.64v
	3	4.58v
	4	4.59v
	5	4.61v
	6	4.61v
	7	4.56v
	8	4.42v
	9	4.54v
	10	0v
	11	3.36v
	12	4.57v
I402	13	4.61v
	14	0v
	15	4.35v
	16	3.72v
	17	0v
	18	4.42v
	19	4.76v
	20	4.59v
	21	1.27v
	22	5.15v
	23	5.1v
	24	4.58v
	25	4.64v
	26	4.64v
	27	4.64v
	28	3.82v



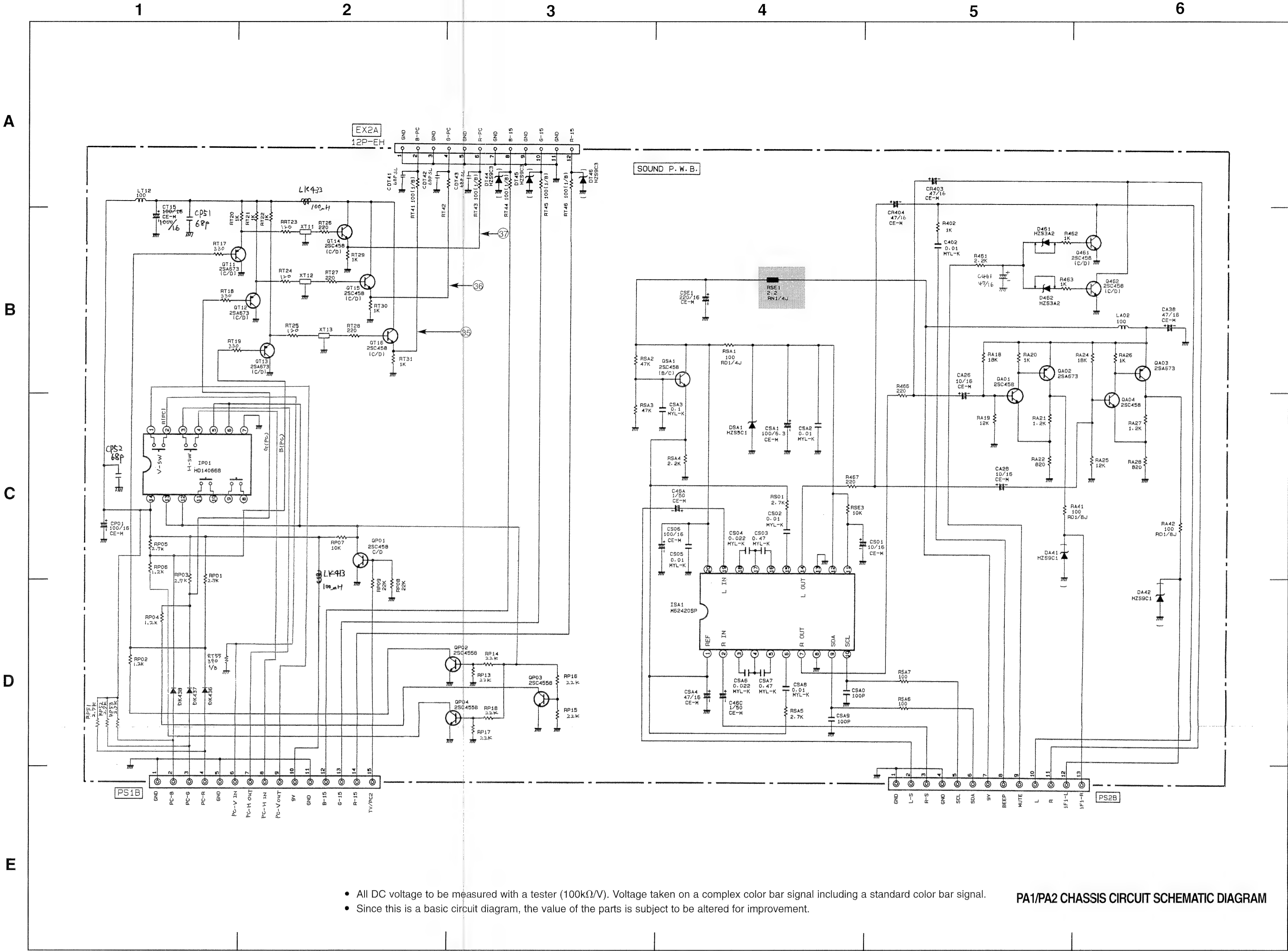
- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

circuit no.	pin no.	DC voltage
I483	1	4.60v
	2	4.22v
	3	4.22v
	4	4.59v
	5	4.59v
	6	0v
	7	0v
	8	27.98v
	9	9.22v
	10	0v
	11	4.65v
	12	4.61v
	13	4.23v
	14	4.65v
	15	4.23v
	16	9.23v

circuit no.	pin no.	DC voltage
Q240	b	3.97v
	c	0v
	e	4.59v
Q241	b	3.97v
	c	0v
	e	4.59v
Q242	b	2.30v
	c	9.17v
	e	1.63v

circuit no.	pin no.	DC voltage
Q271	b	TV mode
	c	0v
	d	9.2v
	e	0v
Q301	b	9.7v(TV)
	c	9.1v(TV)
	d	9.0v(TV)
	e	2.5v(TV)
Q381	b	9.2v(TV)
	c	1.8v(TV)
	d	9.92v(TV)
	e	12.11v(TV)
Q402	b	9.92v(TV)
	c	12.11v(TV)
	d	9.23v(TV)
	e	9.23v(TV)
Q481	b	TV mode
	c	0v
	d	0.6v
	e	0v

circuit no.	pin no.	DC voltage
Q482	b	TV mode
	c	0v
	d	9.22v
	e	0v
Q581	b	0v
	c	4.38v
	d	0v
	e	0v
Q582	b	1.8v
	c	9.2v
	d	4.2v
	e	1.6v



- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.


PA1/PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

circuit no.	pin no.	DC voltage
ISA1	1	3.86V
	2	3.82V
	3	3.81V
	4	3.86V
	5	3.85V
	6	3.85V
	7	3.85V
	8	0V
	9	4.37V
	10	3.72V
	11	5.27V
	12	5.27V
	13	0V
	14	3.83V
	15	3.38V
	16	3.38V
	17	3.84V
	18	3.79V
	19	3.81V
	20	9.18V

circuit no.	pin no.	DC voltage
IP01		PC mode
	1	1.7V
	2	1.7V
	3	1.4V
	4	1.4V
	5	4.8V
	6	4.8V
	7	0V
	8	N/C
	9	N/C
	10	N/C
	11	N/C
	12	4.8V
	13	4.8V
	14	9.24V

circuit no.	pin no.	DC voltage
QT11	b	9.22V
	c	0V
	e	9.1V
QT12	b	9.22V
	c	0V
	e	9.1V
QT13	b	9.22V
	c	0V
	e	9.1V
QT14	b	9.1V
	c	9.12V
	e	8.34V
QT15	b	9.1V
	c	9.12V
	e	8.34V
QT16	b	9.11V
	c	9.11V
	e	8.36V
QP01	b	0.6V
	c	0V
	e	0V
QP02	b	0V
	c	9.21V
	e	0V
QP03	b	0V
	c	9.22V
	e	0V
QP04	b	0V
	c	9.20V
	e	0V

circuit no.	pin no.	DC voltage
Q461	b	0V
	c	0V
	e	0V
Q462	b	0V
	c	0V
	e	0V
QSA1	b	4.48V
	c	9.17V
	e	3.84V
QA01	b	3.72V
	c	8.67V
	e	3.10V
QA02	b	8.67V
	c	6.80V
	e	9.28V
QA03	b	8.66V
	c	6.7V
	e	9.28V
QA04	b	3.75V
	c	8.67V
	e	3.12V

PRODUCT SAFETY NOTE: Components marked with a  and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

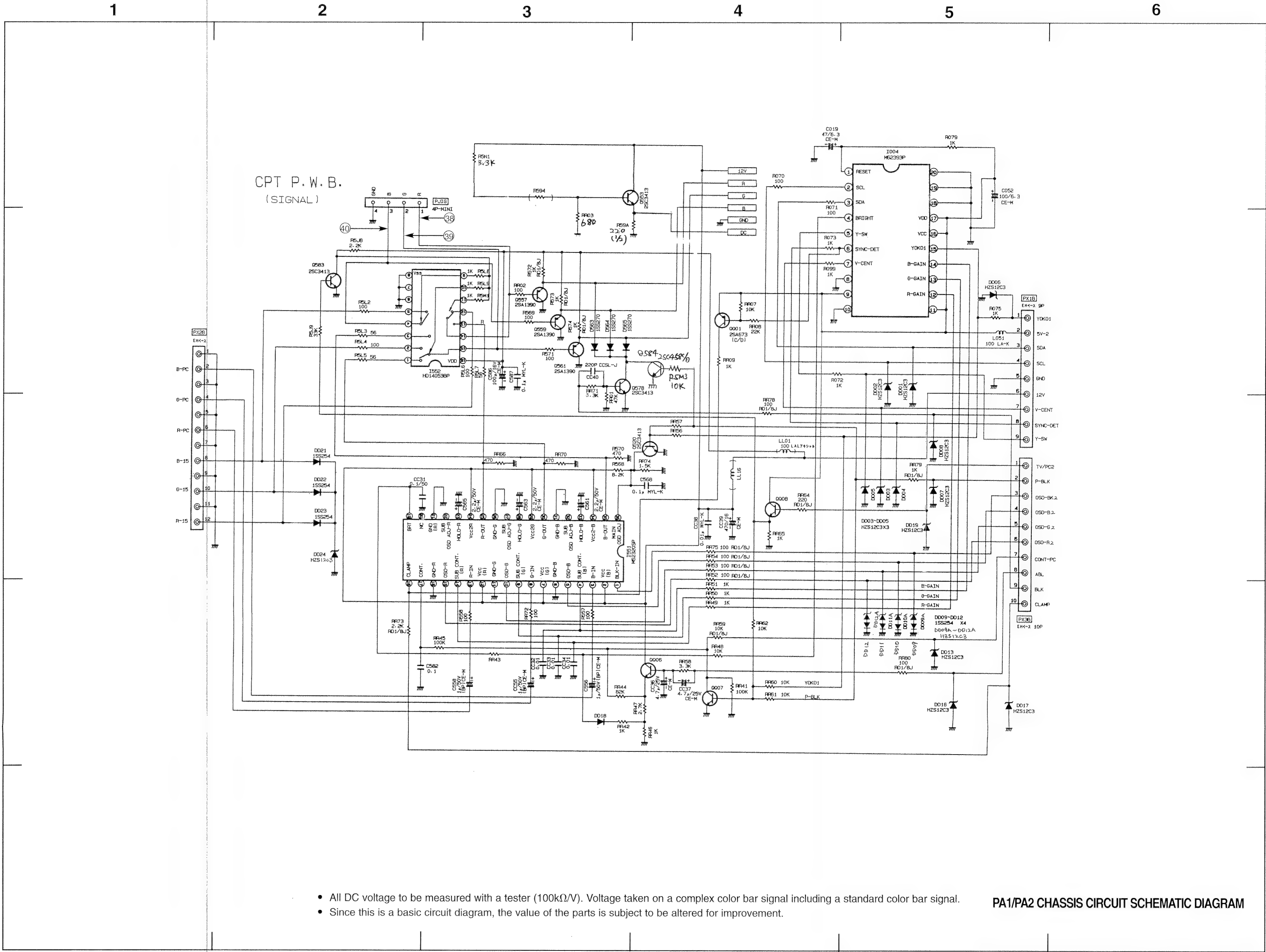
BASIC CIRCUIT DIAGRAM

PC/TV RGB SWITCHING
CIRCUIT DIAGRAM

circuit no.	pin no.	DC voltage / PC Mode
I551	1	0v
	2	11.9v
	3	2.8v
	4	2.82v
	5	0v
	6	0v
	7	11.96v
	8	2.79v
	9	2.92v
	10	0v
	11	0v
	12	11.91v
	13	2.8v
	14	2.94v
	15	0v
	16	0v
	17	2.66v
	18	0.3v
	19	2.48v
	20	0v
	21	0v
	22	5.46v
	23	4.37v
	24	11.93v
	25	3.06v
	26	0v
	27	5.46v
	28	4.38v
	29	11.93v
	30	3.05v
	31	0v
	32	5.46v
	33	0v
	34	11.93v
	35	3.04v
	36	1.96v

circuit no.	pin no.	DC voltage	TV mode	PC mode
I552	1	3.4v	3.1v	
	2	2.7v	1.9v	
	3	3.4v	3.1v	
	4	2.3v	3.2v	
	5	2.3v	1.6v	
	6	0v	0v	
	7	0v	0v	
	8	0v	0v	
	9	0v	11.9v	
	10	0v	11.9v	
	11	0v	11.9v	
	12	2.7v	1.8v	
	13	3.4v	3.0v	
	14	2.7v	3.0v	
	15	2.7v	3.0v	
	16	11.9v	11.9v	

circuit no.	pin no.	DC voltage
I004	1	5.45v
	2	3.68v
	3	4.35v
	4	2.30v
	5	0v
	6	0v(TV) 5.4v(PC)
	7	2.24v
	8	0v
	9	5.45v
	10	0v
	11	5.45v
	12	2.9v
	13	2.9v
	14	2.8v
	15	0v
	16	5.45v
	17	5.45v
	18	0v
	19	0v
	20	0v

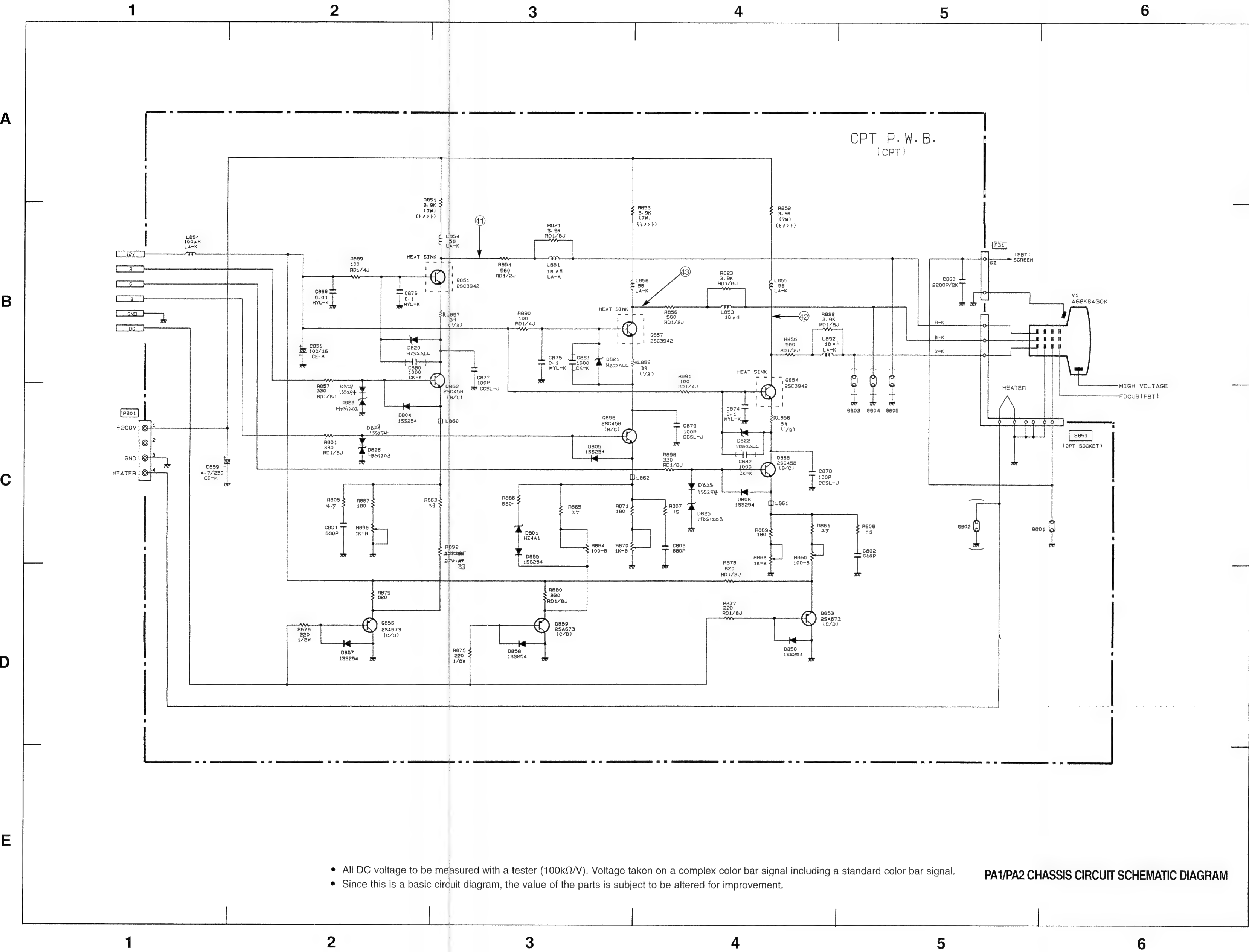


- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1/PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

circuit no.	pin no.	DC voltage	TV mode	PC mode
QQ01	b	4.81v	5.43	
	c	5.4v	0.3	
	e	5.4v	5.44	
	b	7.13v	9.83	
QQ06	c	11.91v	11.95	
	e	6.47v	9.16	
	b	0.66v	0	
	c	0v	2.87	
QQ07	e	0v	0	
	b	4.03v	0	
	c	5.44v	5.44	
	e	3.38v	0	
QQ08	b	0v	0	
	c	1.96v	1.96	
	e	0v	0	
	b	0.7v	0	
Q520	c	0v	11.95	
	e	0v	0	
	b	0v	0	
	c	0v	0	
Q583	e	0v	0	
	b	0v	0	
	c	0v	0	
	e	0v	0	

circuit no.	pin no.	DC voltage	TV mode	PC mode
Q553	b	2v	2v	
	c	11.9v	11.95v	
	e	1.35v	1.36v	
	b	2.63v	3	
Q561	c	0v	0v	
	e	3.26v	3.34v	
	b	2.56v	3v	
	c	0v	0v	
Q557	e	3.2v	3.34v	
	b	2.56v	3	
	c	0v	0v	
	e	3.32v	3.32v	
Q559	b	0v	0v	
	c	3.42v	3	
	e	0v	0v	
	b	0v	0v	
Q578	c	3.4v	3	
	e	0v	0v	
	b	0v	0v	
	c	0v	0v	
Q584	e	0v	0v	
	b	0v	0v	
	c	0v	0v	
	e	0v	0v	



- All DC voltage to be measured with a tester (100k Ω /V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1/PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a \triangle and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

BASIC CIRCUIT DIAGRAM

VM CIRCUIT
DIAGRAM

circuit no.	pin no.	DC voltage
QW02	b	1.12v
	c	12.35v
	e	0.48v
QW03	b	1.92v
	c	8.85v
	e	1.28v
QW04	b	8.84v
	c	14.52v
	e	8.16v
QW05	b	2.23v
	c	5.16v
	e	1.65v
QW06	b	1.84v
	c	9.61v
	e	1.20v
QW07	b	9.60v
	c	14.54v
	e	9.64v
QW08	b	9.61v
	c	0v
	e	9.64v
QW09	b	127.50v
	c	60.68v
	e	127.77v
QW10	b	0.30v
	c	60.75v
	e	0v
QW11	b	0v
	c	0v
	e	0v
QW12	b	2.90v
	c	14.53v
	e	2.25v
QW13	b	1.18v
	c	9.61v
	e	0.50v

A

B

C

D

E

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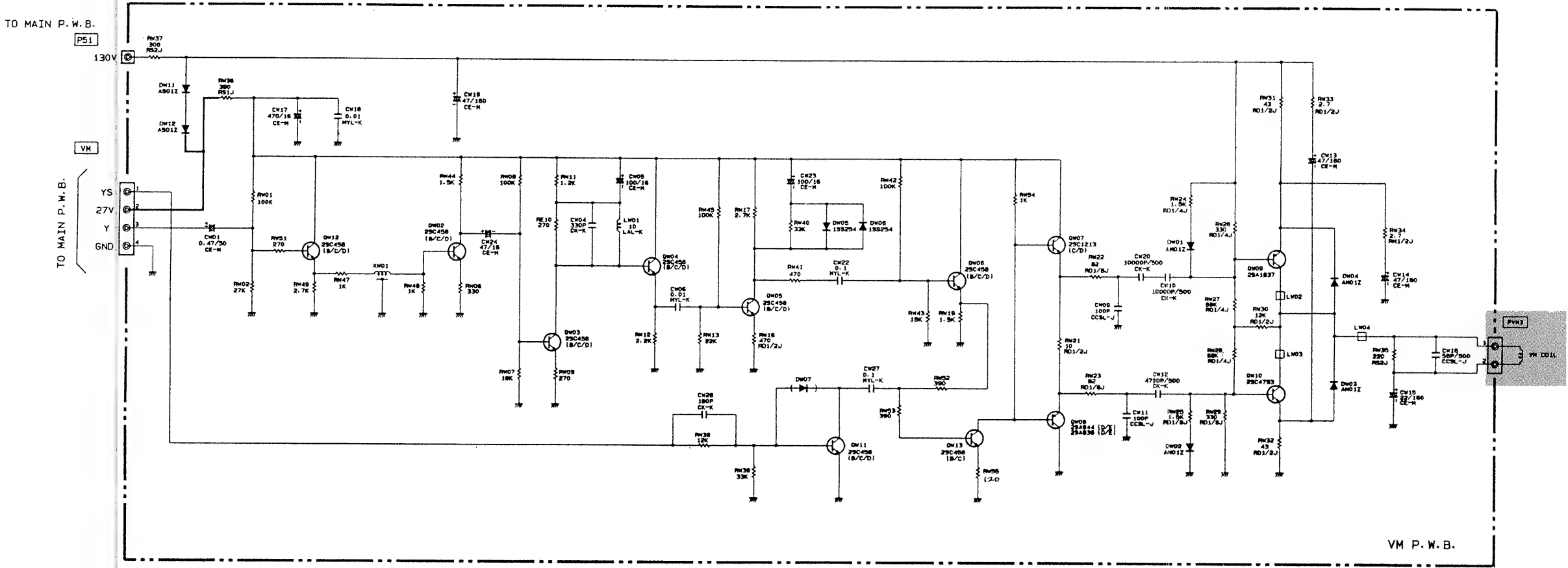
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A

B

C

D

E

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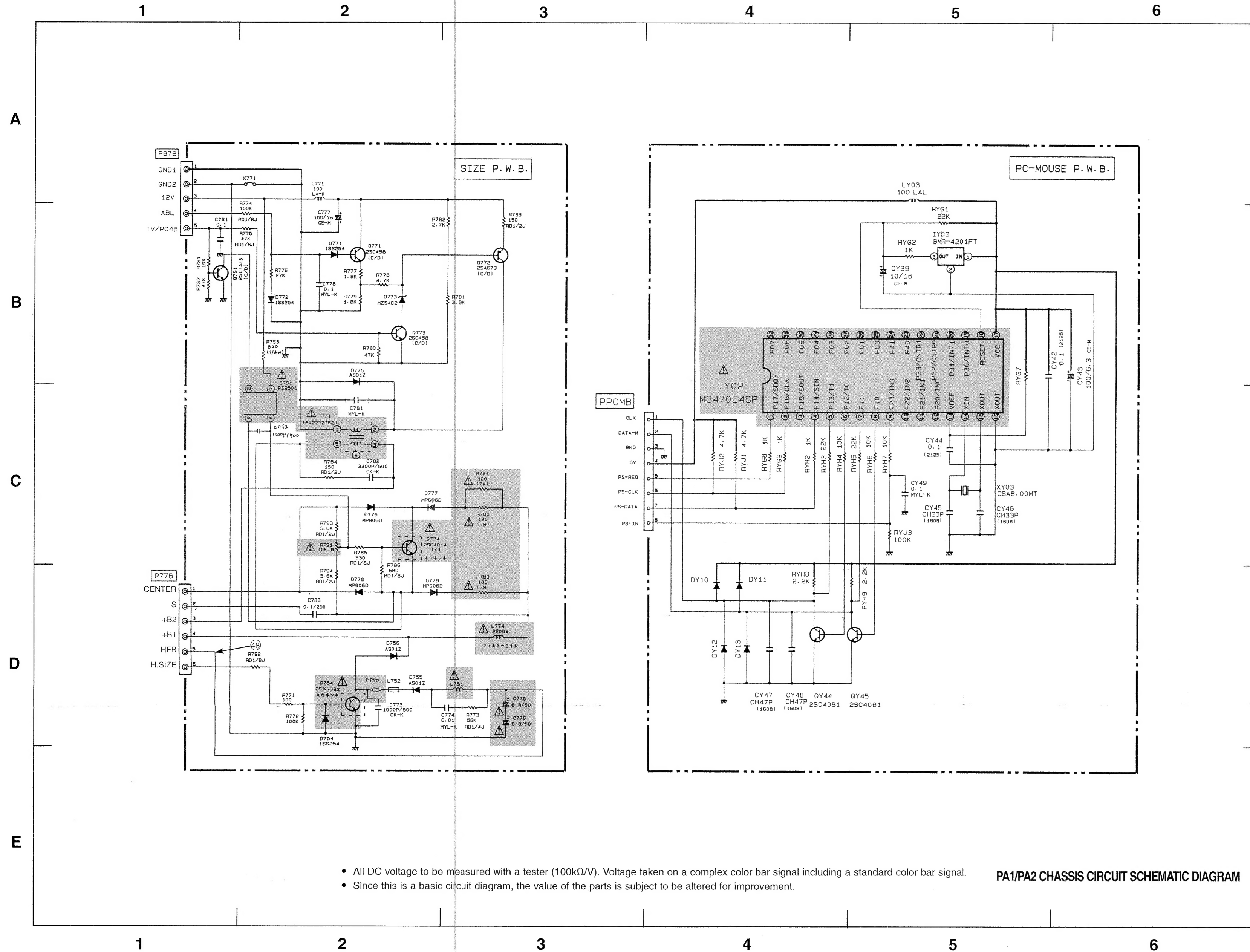
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- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

PA1/PA2 CHASSIS CIRCUIT SCHEMATIC DIAGRAM



circuit no.	pin no.	DC voltage	
		TV mode	PC mode
Q7S1	b	0.68v	0v
	c	0v	12.74v
	e	0v	0v
Q771	b	2.28v	2.82v
	c	12v	12.16v
	e	1.56v	1.92v
Q772	b	4v	5.45v
	c	3v	0v
	e	4.66v	6.12v
Q773	b	0.67v	0
	c	0v	3.94v
	e	1.56v	0v
Q774	b	120v	124.1v
	c	174v	141.1v
	e	120v	123.6
Q754	b	1.75v	2
	c	88.8v	80v
	e	0v	0v

circuit no.	pin no.	TV mode	PC mode
I7S1	1	1.22v	12.72v
	2	0v	12.77v
	3	120v	123.7
	4	120v	125v

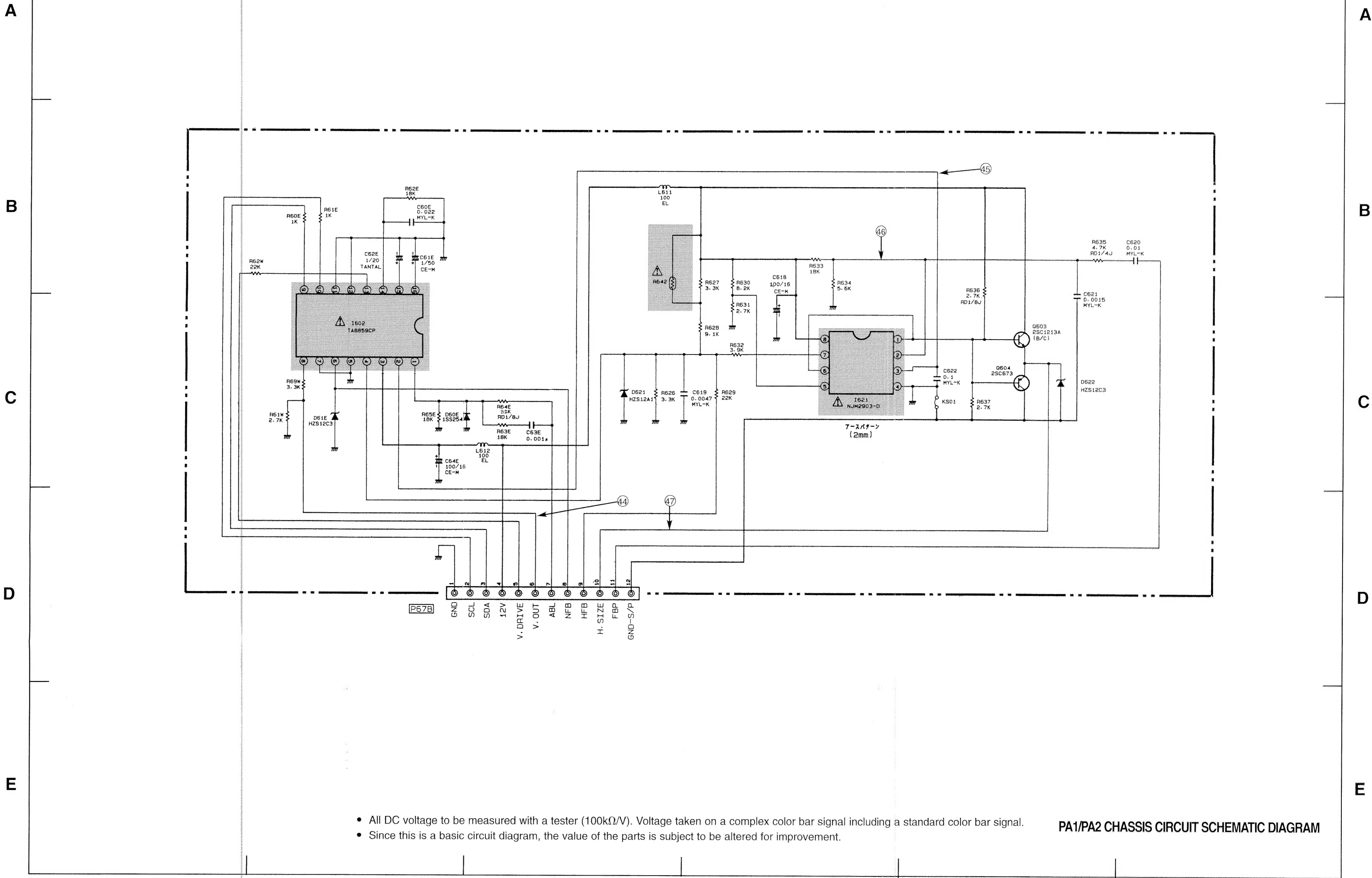
circuit no.	pin no.	DC voltage
IY03	1	4.97v
	2	0v
	3	4.96v
QY44	b	0v
	c	4.97v
	e	0v
QY45	b	0v
	c	4.97v
	e	0v

circuit no.	pin no.	DC voltage PC mode
IY02	1	4.94v
	2	4.98v
	3	4.96v
	4	4.98v
	5	4.96v
	6	0v
	7	4.96v
	8	0v
	9	0v
	10	0v
	11	0v
	12	0v
	13	4.95v
	14	2.25v
	15	2.18v
	16	0v
	17	4.97v
	18	4.96v
	19	0.9v
	20	0v
	21	0v
	22	0v
	23	0v
	24	0v
	25	0v
	26	0v
	27	0v
	28	0v
	29	0v
	30	0v
	31	0v
	32	0v

circuit no.	pin no.	DC voltage
I602	1	2.32v
	2	5.86v
	3	3.75v
	4	2.97v
	5	0v
	6	0v
	7	3.6v
	8	4.5v
	9	1.63v
	10	0v
	11	4.08v
	12	0v
	13	4.32v
	14	11.7v
	15	1.48v
	16	1.74v

circuit no.	pin no.	DC voltage
I621	1	1.58v
	2	2.8v
	3	1.47v
	4	0v
	5	2.94v
	6	1.59v
	7	3.37v
	8	11.7v

circuit no.	pin no.	DC voltage
Q603	b	1.58v
	c	11.72v
Q604	e	1.45v
	b	1.58v
	c	0v
Q604	e	1.45v



NOTES:

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